AIM OF THE WORK

The aim of this work is to determine the patterns, management and outcome either morbidity or mortality of those patient who had been subjected to missile injuries admitted to the Emergency Department in the Alexandria Main University Hospital during and after 25th of January Egyptian revolution.

PATIENTS

The study included all patient with missile injuries admitted to the Emergency Department of Alexandria Main University Hospital in a period from 25th of January 2011to 25th of July 2011,their medical records had been retrospectively reviewed aiming to collect the pattern of presentation, early and late management and outcome either morbidity or mortality during their hospital stay.

Data obtained from the records showed that our patients were 507 persons in whom 1138 injuries were found. Some of them had single injury and the majority had multiple injuries that need different specialties for their management.

METHODS

Confidentiality of the Patients' reports was considered. Permission from ethical committee had been obtained before study. All patients records included in this study were reviewed for the following items:

1. Personal data:

- Age.
- Sex.
- Occupation.
- Residence.

2. Primary survey:

➢ *A= Airway maintenance with cervical spine protection*

-Airway was assessed for patency and clearance.

- Patient who was able to talk, his airways were likely to be clear and this patient cervical spine was protected only.
- Unconscious patient who was not able to maintain his own airways; the airway was opened using a chin lift or jaw thrust combined with bimanual inline spinal immobilization.
- Airway adjuncts sometimes were required.
- Airways which were blocked (e.g., by blood or vomitus), the fluid were cleaned out of the patient's mouth by the help of suctioning instruments.
- In case of obstruction, an endotracheal tube was passed.
- Neck collar was used for patients with suspected cervical spine injury.

➢ *B= Breathing and ventilation*

- The chest was examined by inspection, palpation, percussion and auscultation.
- . The rate and depth of respirations were determined.
- The neck and chest were examined for tracheal deviation, unilateral and bilateral chest movement and use of accessory muscles. Palpation was done for assessment of fracture ribs, sites of tenderness. Percussion of the chest was done for presence of dullness or hyper resonance. Auscultation of the chest bilaterally was done for air entry assessment and additional sounds.
- Life-threatening thoracic conditions were identified and managed; as airway obstruction were treated using air way adjuncts up to an endotracheal tube, tension pneumothorax, and hemothorax were treated using high flow oxygen and tube thoracostomy drainage.

➢ *C= Circulation with hemorrhage control*

-The pulse was examined for quality, rate, and equality.

- Two large-bore intravenous lines were established. IV fluid therapy with crystalloid solution and cross matched blood product was initiated.
- External bleeding was controlled by direct pressure.
- Identification of potential source(s) of internal hemorrhage was done.

➢ *D= Disability/Neurologic assessment*

- Basic neurological assessment was made, known by the mnemonic AVPU (alert, verbal stimuli response, painful stimuli response, or unresponsive).
- Neurological examination was done with emphasis on Glasgow Coma Scale (GCS); The GCS is scored between 3 and 15, 3 being the worst, and 15 the best. It is composed of three parameters : Best Eye Response, Best Verbal Response, Best Motor Response, as given below :
  - Best Eye Response; [1] No eye opening, [2] Eye opening to pain, [3] Eye opening to verbal command, [4] Eyes open spontaneously.
  - Best Verbal Response; [1] No verbal response, [2] Incomprehensible sounds, [3] Inappropriate words, [4] Confused, [5] Orientated.
  - Best Motor Response; [1] No motor response, [2] Extension to pain, [3] Flexion to pain, [4] Withdrawal from pain, [5] Localising pain, [6] Obeys Commands.

➢ *E= Exposure and environmental control*

- The patient completely undressed.
- Patients were covered with warm blankets to prevent hypothermia in the emergency department.
- Intravenous fluids were warmed and a warm environment maintained.
- Patient privacy was maintained.

3. Standard Resuscitation:

- Victims with no suspected cervical spine trauma, their airways were opened using the head-tilt/chin-lift maneuver.
- When a spinal injury suspected; the patient was kept completely unmoved. Neck collar was placed or the head and neck were hold to prevent movement.
- Fingers were used to grasp the jaw gently and lift it forward.
- CPR began for patients with no pulse.
- The CPR cycle is often abbreviated as 30:2 (30 compressions, 2 ventilations or breaths).
- Artificial ventilation was administered using a bag-valve-mask (BVM).
- An intravenous line (IV) was established and connected to a 1000 ml bag of normal saline.
- Crystalloids had been given as rapidly as possible.

4. Secondary Survey

Head-to-toe evaluation had been done including a complete history and physical examination;

- Vital signs had been reevaluated.
- Head and neck examination

  Examination of the entire head and face for gunshot inlet wound were done. Level of consciousness and GCS score was reevaluated. Inspection of ears and nose for cerebrospinal fluid leakage.

  Examination of the neck for the clinical signs of arterial injury was done including: pulse deficit, bruit, expanding hematoma, and arterial bleeding.
- Chest examination

  Assessment for signs of chest injuries, pattern of breathing, palpation for fractures and surgical emphysema, auscultation of breath and heart sounds were done. Tube thoracostomy under water seal drainage was inserted when indicated. Open chest wounds were covered with sterile dressing till cardiothoracic surgeon assessment.
- Abdominal examination

  The abdomen and the back were inspected for contused wound of gunshot inlet or exit. Visual inspection for abdominal distention, which may be due to pneumoperitoneum, abdominal collection, or ileus produced by peritoneal irritation, was important.

  Palpation signs revealed local or generalized tenderness, guarding, rigidity, or rebound tenderness, which suggests peritoneal injury. Such signs appearing soon after an injury suggest leakage of intestinal content. Peritonitis due to intra-abdominal hemorrhage may take several hours to develop.
- Extremities: the most important were vascular examination. We collected data about;
  - Pulse: absent or present
  - Bleeding: active or stopped
  - Capillary refilling
  - Cold or warm limb

5. Tertiary Survey

Serial assessments were obtained from records help recognize missed injuries and related problems.

6. Results of Laboratory investigation especially:

- Complete blood picture.
- Serum creatinine and Serum urea.
- Bleeding Profile.
- Random Blood Sugar.
- Any other available helpful data

7. Details of Medical & surgical management included:

- Full description of injury.
- The diagnostic imaging tests were done as the patient's condition permitted these included: chest X-ray, U/S abdomen, CT scan of the chest, abdomen, Orbit and brain and duplex.
- Details of surgical interference.
- Post-operative care.
- Outcome (i.e. no disability, disability or death)

RESULTS

The current study was carried out on victims of missile injuries who were admitted to the surgical emergency department in Alexandria main university hospital through a period of six months starting from 25th January 2011. During this period a total of 507 cases were studied, who had 1138 injuries. This study revealed that, 401 (79%) patient injured by pellet, and 106 (21%) patient were injured by bullet.

1- Distribution of studied cases according to personal data:

I. Distribution of studied cases according to gender: (Table I, Fig. 1)

Table (I) shows that male patients had higher incidence of missile injuries (97%) than female patients (3%).

II. Distribution of studied cases according to age: (Table I, Fig. 2)

Figure (2) shows that the third decade was the most common (52%) age group affected by missile injury followed by the second decade (20%), fourth decade (16%), fifth decade (9%), and the least were occurred in the age above 50 (3%). No missile injury occurred in the first decade.

III. Distribution of studied cases according to occupation: (Table I, Fig. 3)

Figure (3) shows that the highest incidence was seen among the unemployed (44.1%), then shows slightly descending order among the manual workers (36.3%), then among the student (10.3%), and the lowest incidence among the employee and housewives by (8.3%) and (1%) respectively.

Table (I): Distribution of the studied cases according to demographic data

	No.	%
Sex		
Male	491	97
Female	16	3
Age		
10 - <20	101	20
20 - <30	262	52
30 - <40	83	16
40 - <50	45	9
50 - <60	8	1.5
>60	8	1.5
Occupation		
Employee	42	8.3
House wife	5	1
Unemployed	224	44.1
Student	52	10.3
Manual worker	184	36.3

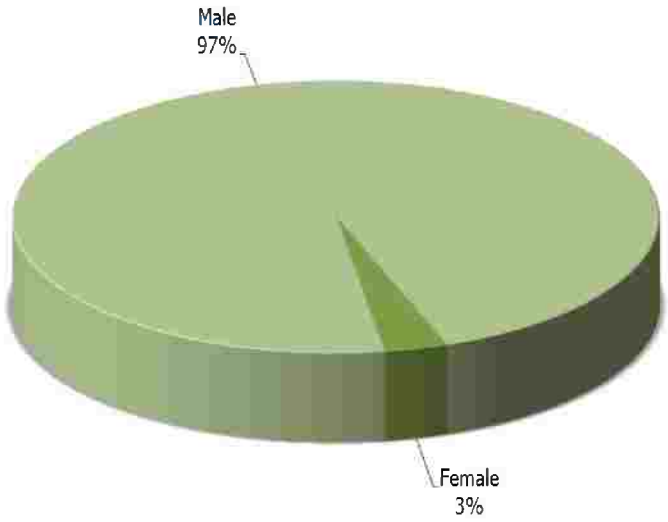

Figure (1): Distribution of the studied cases according to gender.

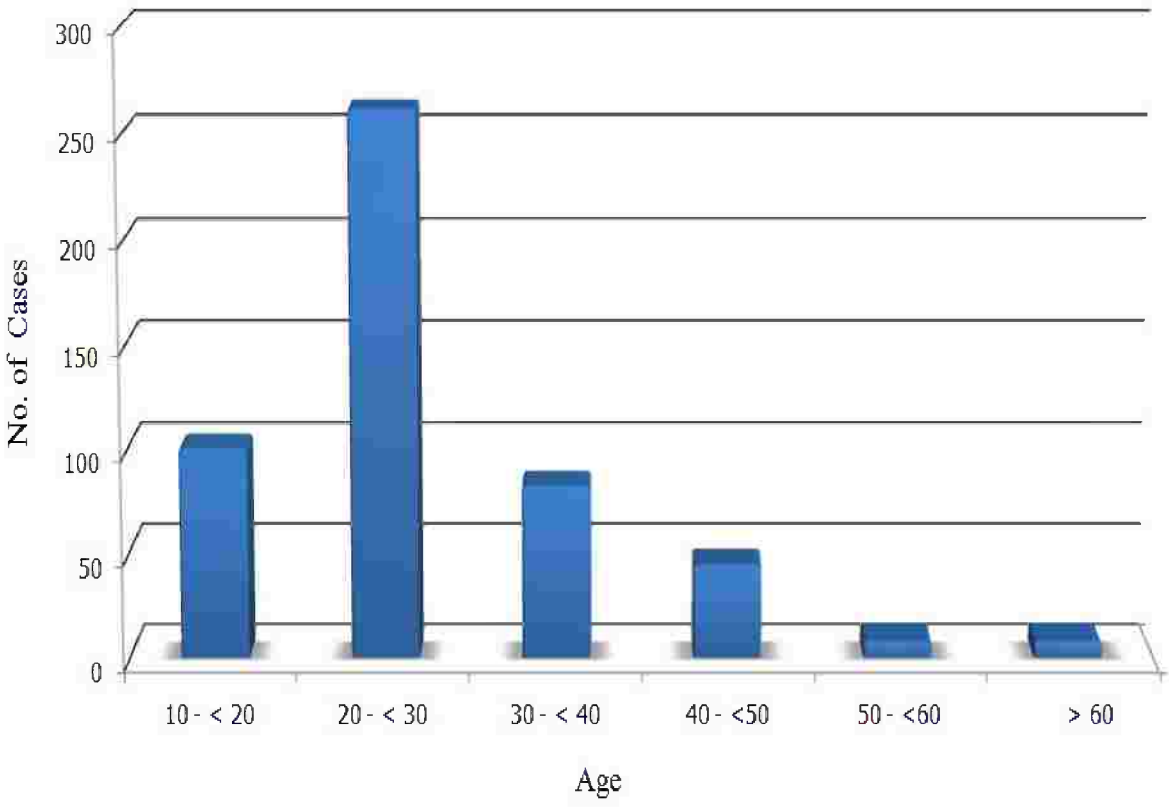

Figure (2): Distribution of the studied cases according to age.

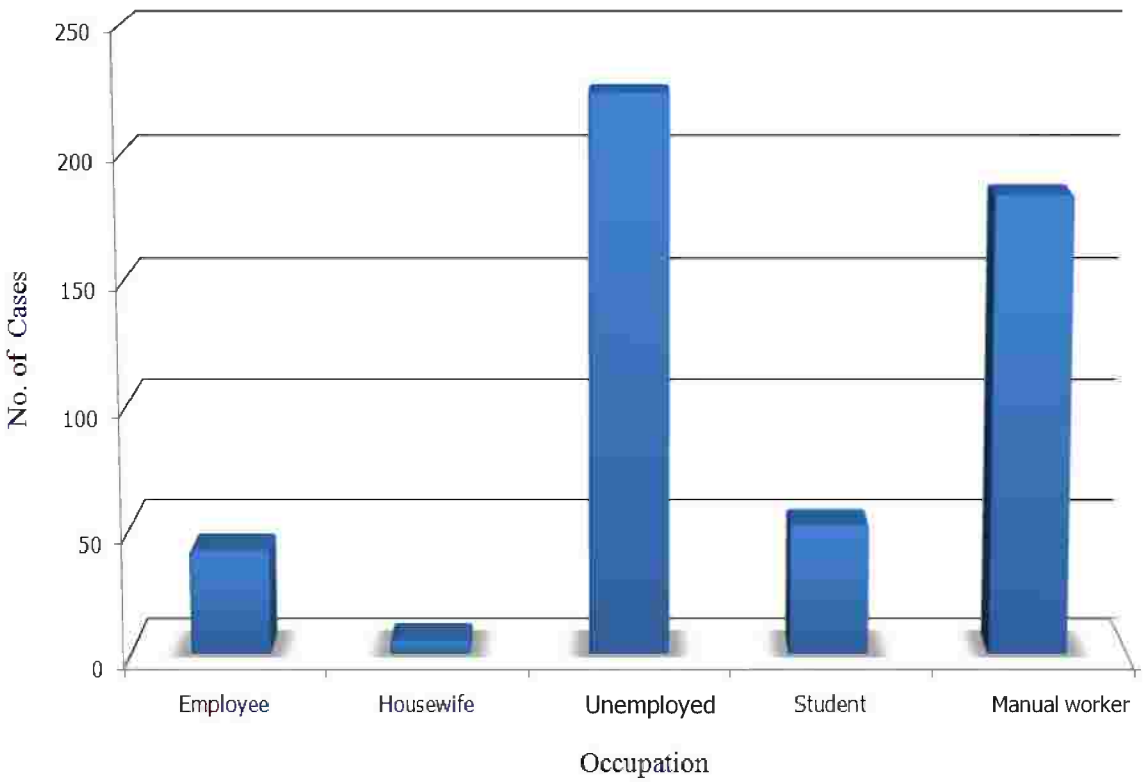

Figure (3): Distribution of the studied cases according to occupation.

2- Distribution of studied cases according to hemodynamic stability: (Table II, Fig. 4)

Table (II) shows that (90%) of the studied cases were hemodynamically stable and only (10%) were hemodynamically unstable on presentation to causality.

Table (II): Distribution of the studied cases according to hemodynamic stability

	No.	**%**
Hemodynamic stability		
Stable	458	90
Unstable	49	10

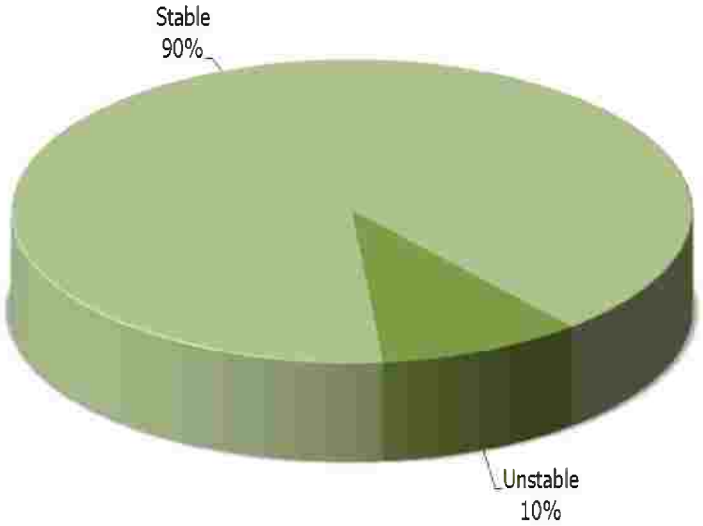

Figure (4): Distribution of the studied cases according to hemodynamic stability.

3- Distribution of studied cases according to Glasgow Coma Scale (GCS): (Table III, Fig.5)

Table (III) shows that 484 (95.46 %) patients had GCS of 13 - 15, 1.78 % of patients were recorded 9 - 12, and 2.75 % of patients were recorded less than 8.

Table (III): Distribution of the studied cases according to GCS:

	No.	%
GCS		
3 - 5	10	1.97
6 - 8	4	0.78
9 - 12	9	1.78
13 - 15	484	95.46
Grand Total	507	

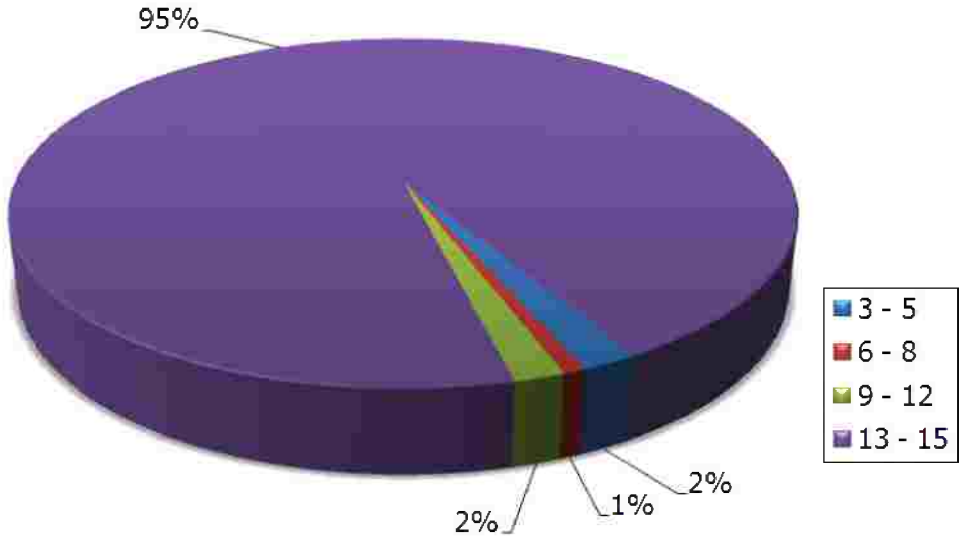

Figure (5): Distribution of the studied cases according to GCS.

4- Distribution of the studied cases according to laboratory investigations

Table (IV) shows the laboratory investigations for 383 patients who were recorded for the investigation while 124 patients were not recorded (missed data).

Table (IV): Distribution of the studied cases according to laboratory investigation

		No.	%
Complete Blood Count (CBC)	**Hb Level**		
	Normal	270	70
	Anemia	113	30
	Hematocrite level		
	Normal	249	65
	Low	134	35
	Platelet level		
	Normal	350	91
	Thrombocytopenia	25	7
	Thrombocytosis	8	2
	WBCs level		
	Normal	241	63
	Leucocytosis	142	37
Renal function	**Renal function test**		
	Normal	345	90
	Impaired	38	10
Bleeding Profile	**Prothrompin activity**		
	Normal	363	95
	Low	20	5
	Bleeding Time (BT)		
	Normal	355	93
	Prolonged	28	7
	Clotting Time (CT)		
	Normal	360	94
	Prolonged	23	6
	Partial Thromboplastin Time (PTT)		
	Normal	379	99
	Prolonged	4	1
	INR		
	Normal	359	94
	High	24	6

Random Blood Sugar (RBS)	**RBS Level**		
	Normal	307	80
	High	50	13
	Low	26	7

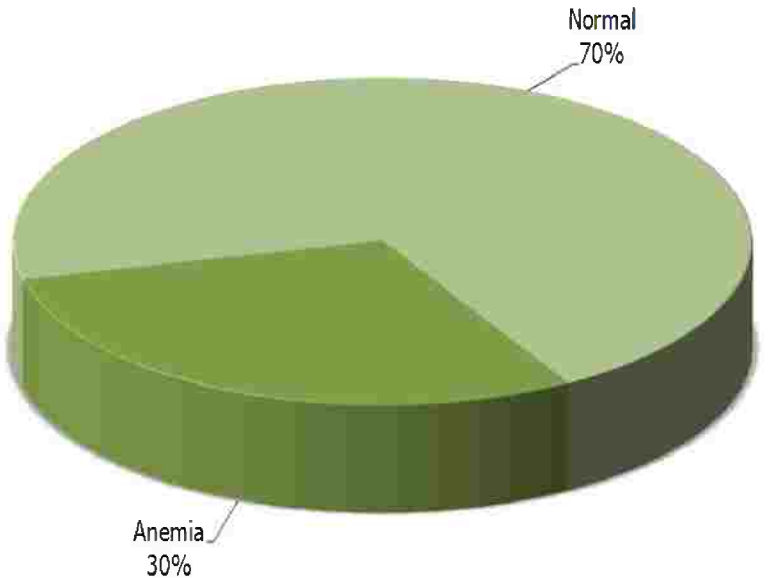

Figure (6): Distribution of the studied cases according to Hb level.

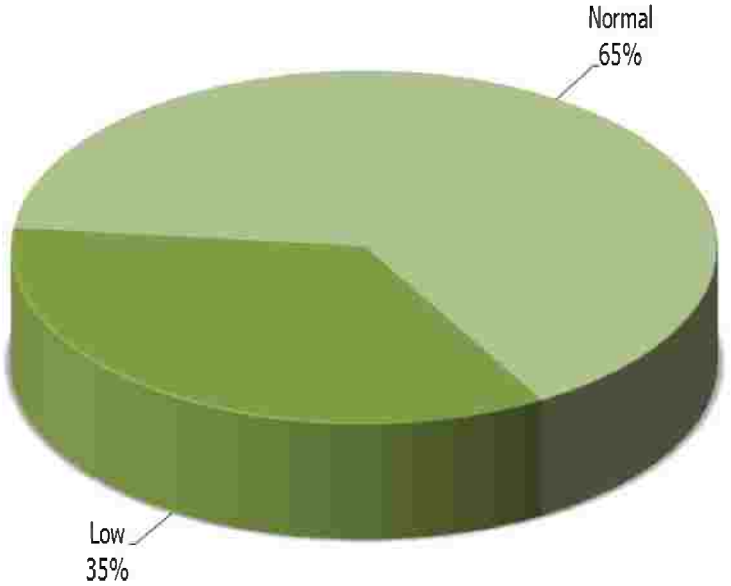

Figure (7): Distribution of the studied cases according to Hematocrite level.

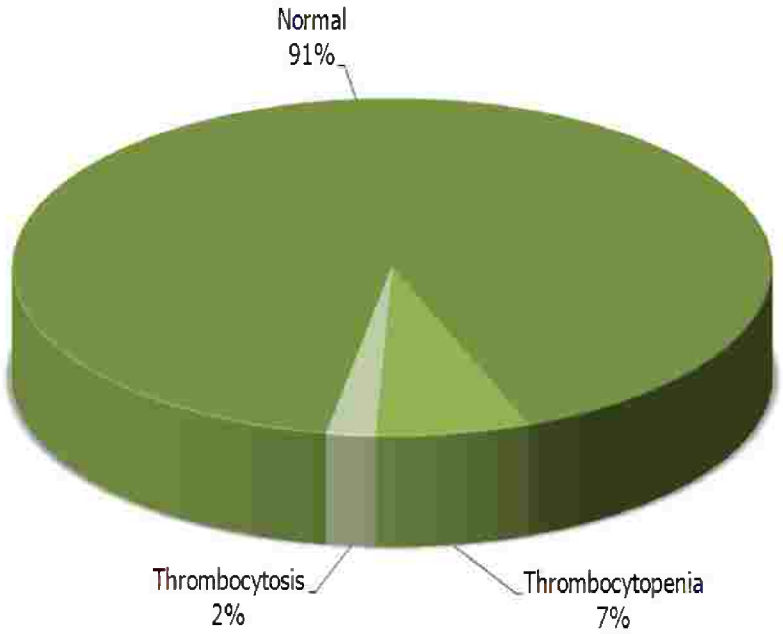

Figure (8): Distribution of the studied cases according to Platelet level.

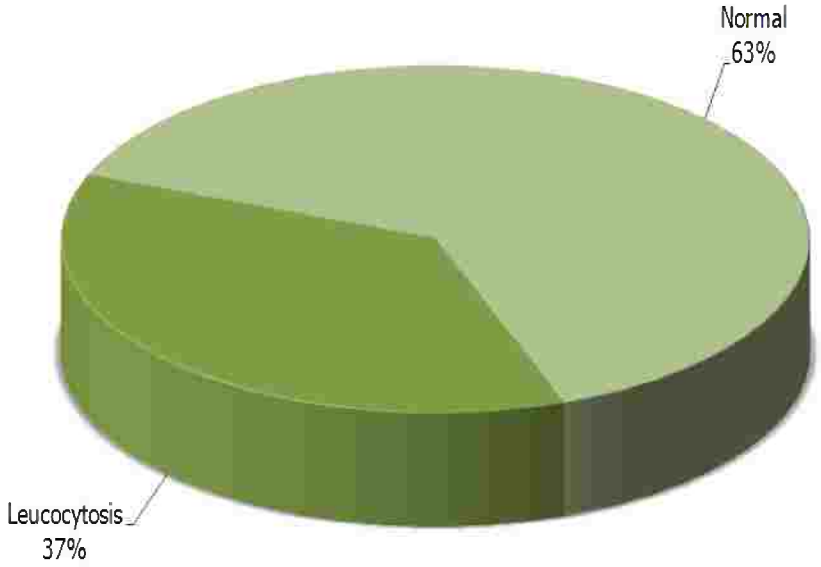

Figure (9): Distribution of the studied cases according to WBCs level.

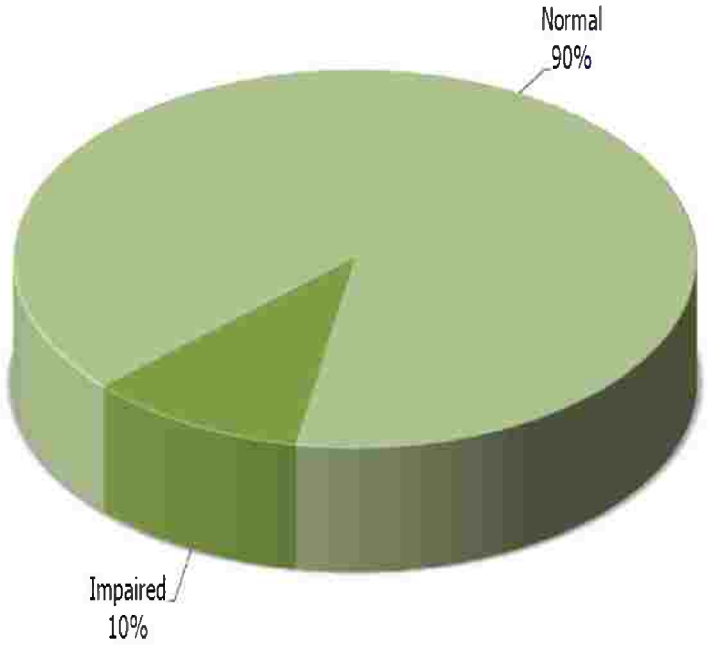

Figure (10): Distribution of the studied cases according to renal function test.

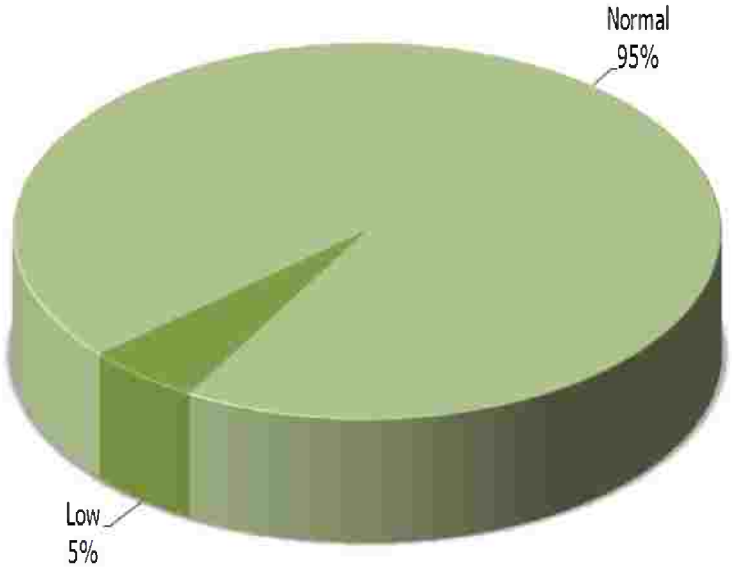

Figure (11): Distribution of the studied cases according to Prothrompin activity.

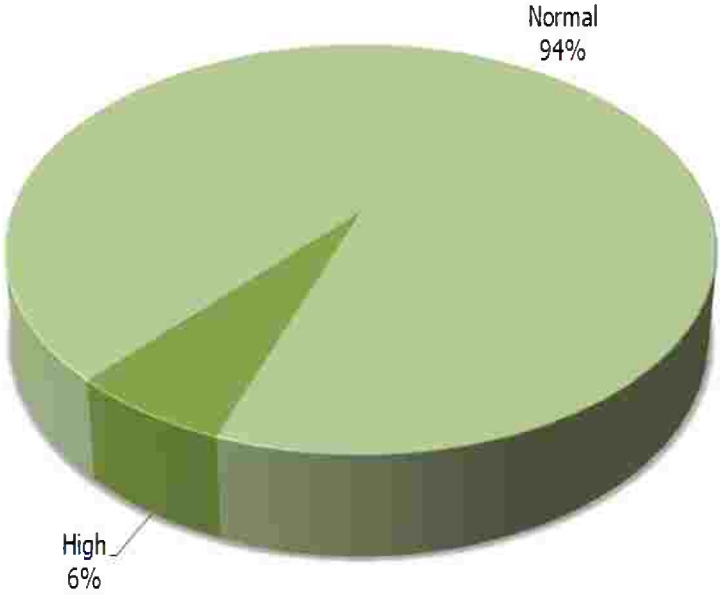

Figure (12): Distribution of the studied cases according to INR.

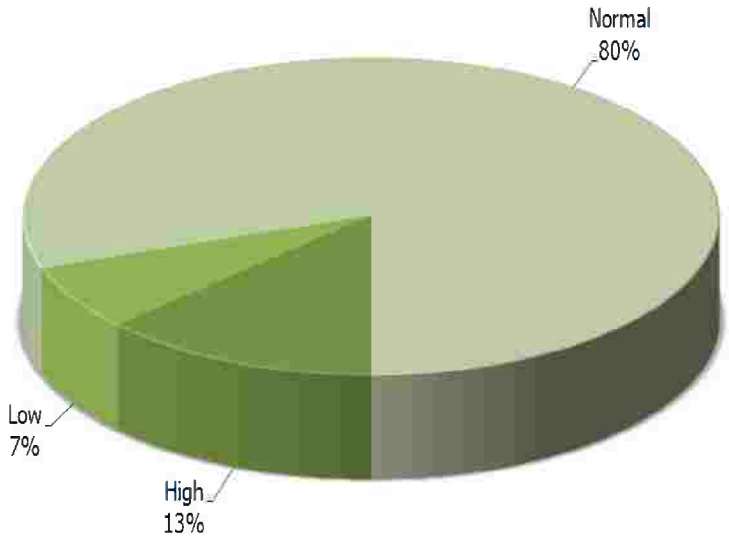

Figure (13): Distribution of the studied cases according to RBS Level.

5. Distribution of studied cases according to number of injuries: (TableV, Fig.14)

Table V shows that the majority 63% (319) of patient had multiple injuries, and 37% (188) had single injury.

Table (V): Distribution of the studied cases according to site of injury

	No.	%
Site of Injury (n= 507)		
Single injured patient	188	37
Multiple injured patient	319	63

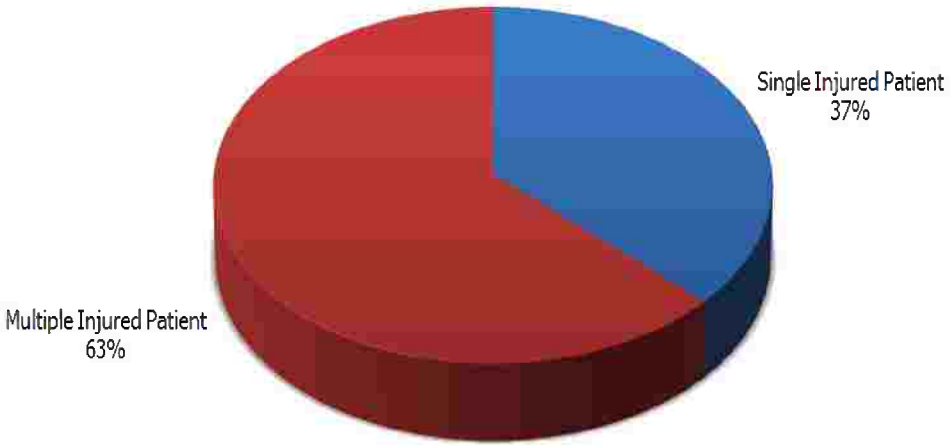

Figure (14): Distribution of the studied cases according to number of injuries.

6. Distribution of studied cases according to site of injury: (TableVI, Fig.15)

Figure (15) shows that the highest incidence was seen in lower and upper limb (22.58%) and (21.35%) respectively, followed by the head (15.38%), then shows descending order in abdomen (11.51%), then slightly descending order in chest, eye, and neck (10.54, 9.49, and 5.18 %) respectively. The lowest incidence was seen in back, gluteal region, spinal cord, inguinal region, and scrotum.

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Table (VI): Distribution of the studied cases according to site of injury

	No.	%
Site of Injury (n= 1138)		
Lower Limb	257	22.58
Upper Limb	243	21.35
Head	175	15.38
Abdomen	131	11.51
Chest	120	10.54
Eye	108	9.49
Neck	59	5.18
Back	20	1.76
Gluteal region	12	1.05
Spinal Cord	6	0.53
Inguinal Region	5	0.44
Scrotum	2	0.18

Table (VI) cond: Distribution of the studied cases according to specific extremities.

	No.	%		No.	%
Lower Limb Injury (n=257)			**Upper Limb Injury (n= 243)**		
Thigh	131	50.97	Hand	91	37.45
Leg	81	31.52	Forearm	64	26.34
Knee	18	7.00	Arm	45	18.52
Foot	14	5.45	Shoulder	43	17.70
Ankle	13	5.06			

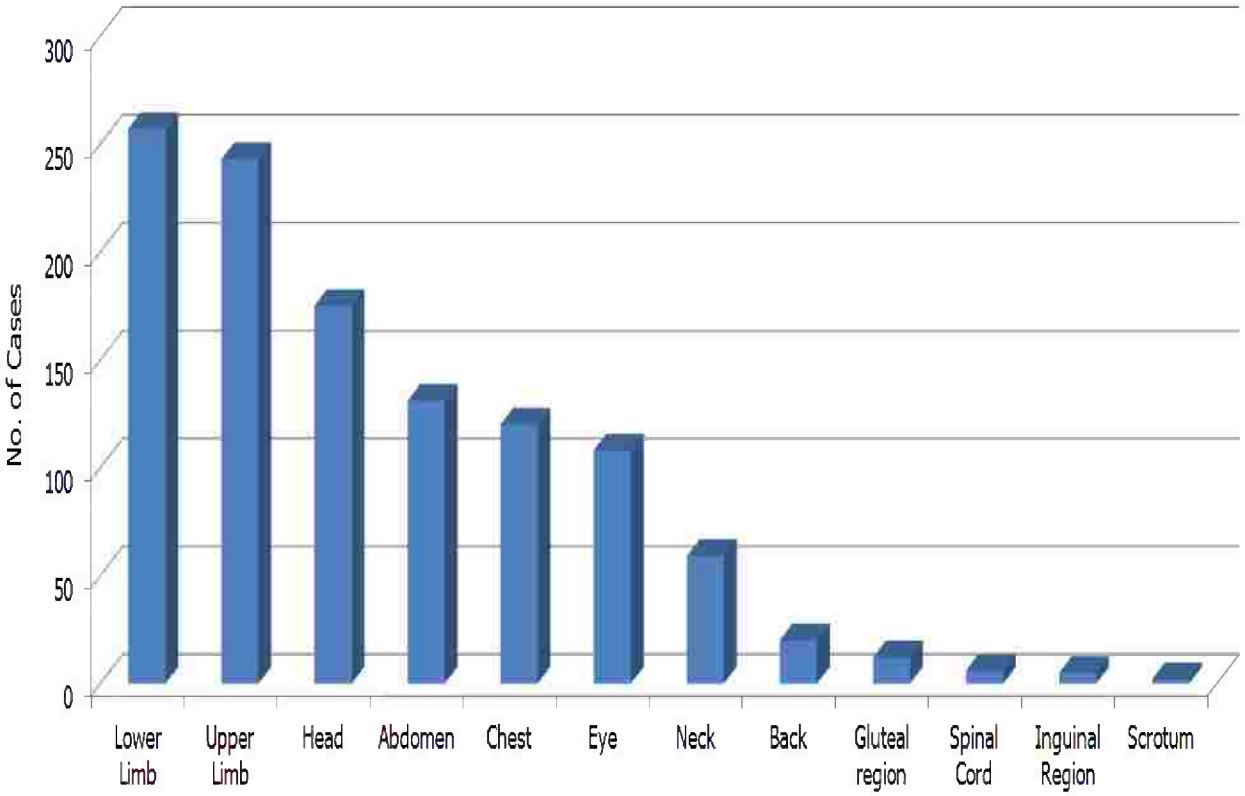


Figure (15): Distribution of the studied cases according to site of injury.

7- Distribution of studied cases according to management:

A. Distribution of studied cases according to investigation:

I. Distribution of studied cases according to plain x-ray: (Table VII, Fig. 16)

Table (VI1) shows that among 507 patients admitted with missile injuries, 256 had plain x-ray films which were positive for metallic body and those were injured either by bullet or pellet.

As regards to bullet cases, we found that thigh show the highest incidence 8.2% then gluteal region with 1.56% and the hand shows the lowest percent by 0.78%.

Again thigh came in the first order in the pellet cases by about 34% then the second order was chest pellet by 25.4% then greatly decreased to 5.5% in ankle then hand, arm, forearm, gluteal region, leg, mandible and shoulder take lower order ranging from about 1% to 4%.

Cases of pneumothorax were found in x-ray films were 7.03%.

Table (VII): Distribution of the studied cases according to plain x-ray.

	No.	%
Plain x-ray (n = 256)		
Bullet in thigh	21	8.20
Bullet in gluteal region	4	1.56
Bullet in Hand	2	0.78
Pellet in thigh	87	33.98
Pellet in chest	65	25.40
Pellet in Ankle	14	5.47
Pellet in Hand	10	3.91
Pellet in arm	8	3.13
Pellet in forearm	8	3.13
Pellet in gluteal region	8	3.13
Pellet in leg	4	1.56
Pellet in mandible	4	1.56
Pellet in Shoulder	3	1.17
Chest: pneumothorax	18	7.03

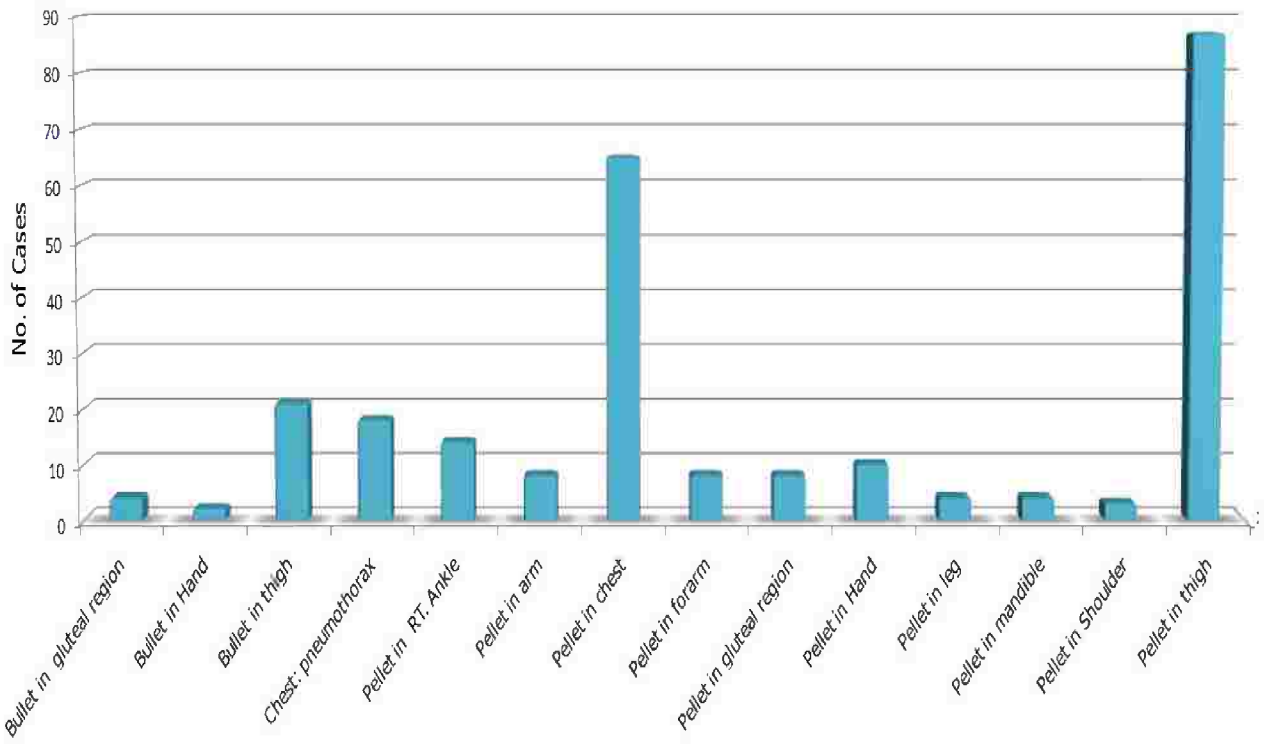


Figure (16): Distribution of the studied cases according to plain x-ray.

II. Distribution of studied cases according to U/S abdomen: (Fig. 17)

It was recorded that, cases of abdominal missile injury reached 131, only 76 case undergo U/S abdomen. Fig. 20, shows that 59.21% of abdominal sonography was free, 18.42% had minimal free IPF collection. 17.11% had pneumoperitoneum and liver tear. And only 5.26% had liver tear and pancreatic tear.

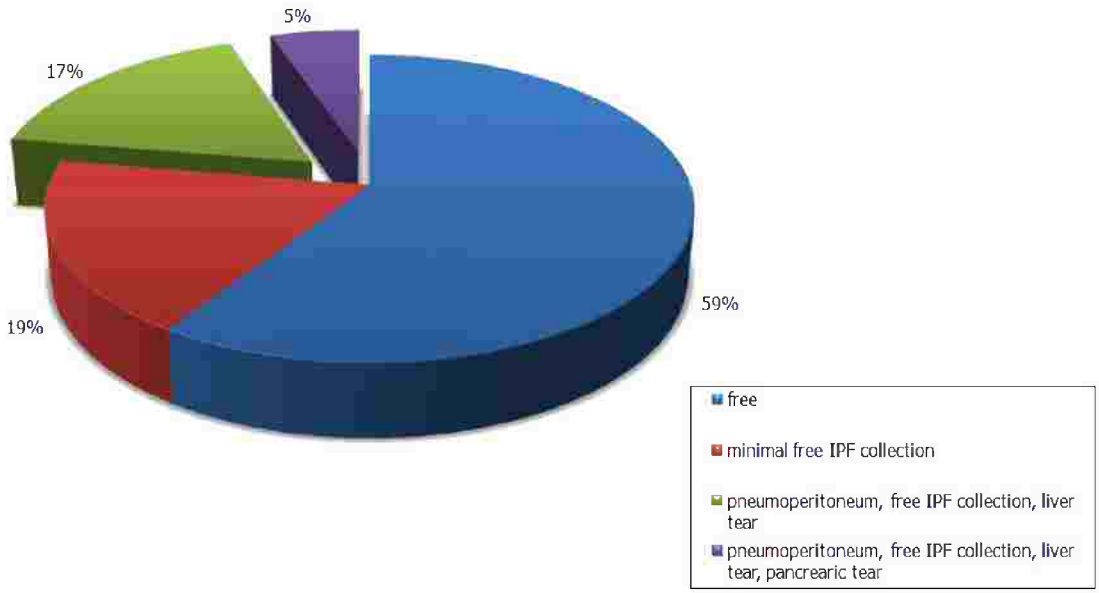


Figure (17): Distribution of the studied cases according to U/S abdomen.

III. Distribution of studied cases according to CT Chest: (Table VIII, Fig. 18)

In the current study, 87 case undergo Chest CT out of total 120 chest injured case. Table (VIII) shows the positive results which included; the highest incidence was Pellet in anterior chest wall (74.71%). Then surgical emphysema, pleural collection, and lung contusion (14.94%), then pneumothorax and hemothorax (5.75%). And 4.60% of patients had pneumothorax alone.

Table (VIII): Distribution of the studied cases according to CT chest

	No.	%
CT chest (n =87)		
Free	0	0.00
Pellet in anterior chest wall	65	74.71
pneumothorax	4	4.60
Pneumothorax and hemothorax	5	5.75
Surgical emphysema, pleural collection, lung contusion	13	14.94

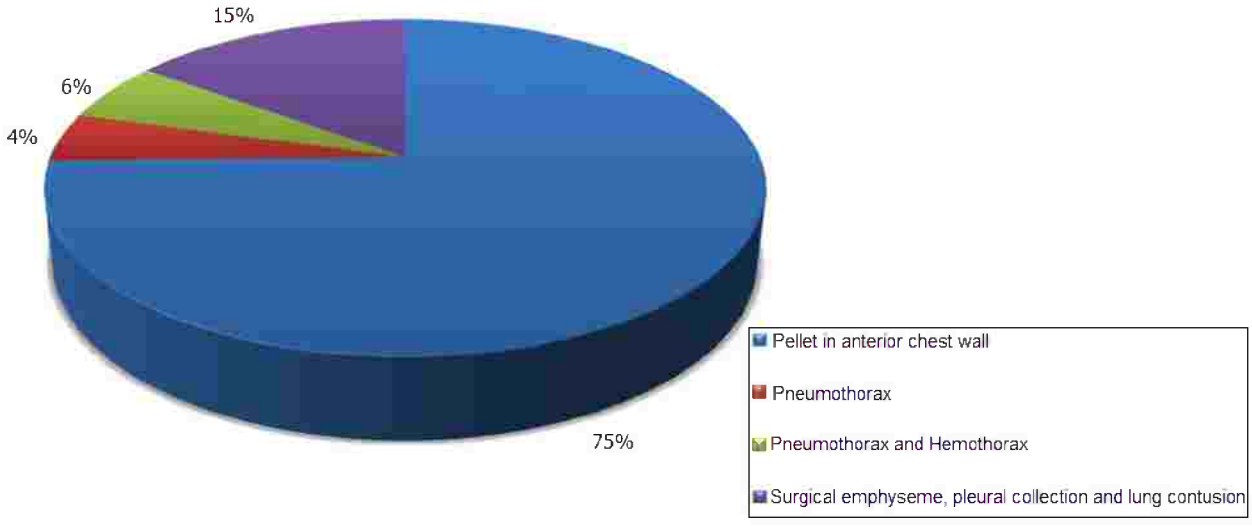


Figure (18): Distribution of the studied cases according to CT chest.

IV. Distribution of studied cases according to CT abdomen: (Table IX, Fig. 19)

In this study 85 abdominal CT done out of 131 case of abdominal injuries. Table (IX) shows that 50.59% of CT abdomen showed pellet in anterior abdominal wall (AAW), and summation of other injuries were equal (44.71%) while 4.71% were free.

Table (IX): Distribution of the studied cases according to CT abdomen

	No.	%
CT abdomen (n= 85)		
Free	4	4.71
Pellet in AAW	43	50.59
Minimal free IPF collection	9	10.59
Minimal free IPF collection, pellet in AAW, liver lobes and between bowel loopes	5	5.88
Mild pneumoperitoneum, free IPF collection, Bullet track, surgical emphysema, liver tear	24	28.24

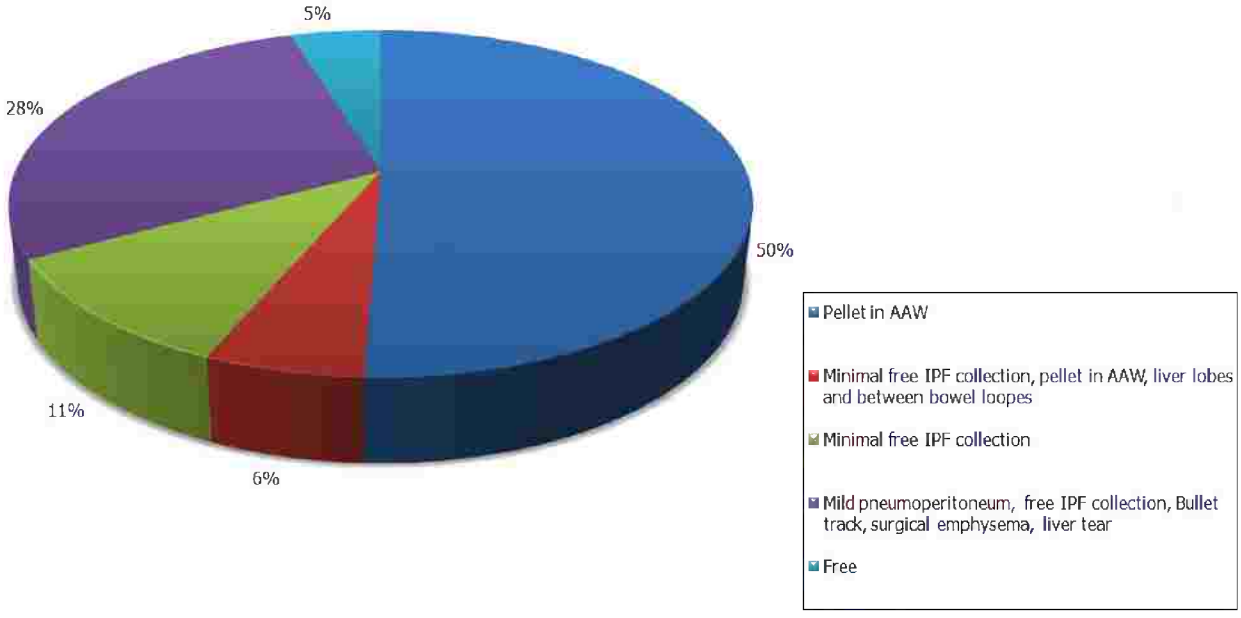


Figure (19): Distribution of the studied cases according to CT abdomen.

V. Distribution of studied cases according to CT skull:

In the current study, all cases of CT skull (49 case) were pellet at superficial skin level.

VI. Distribution of studied cases according to CT orbit: (Table X, Fig. 20)

The results recorded 108 orbital injuries, 98 cases only undergo orbital CT. Table (X) shows that 64.29% of the CT orbit cases showed intra-orbital pellet and only 35.71% were free.

Table (X): Distribution of the studied cases according to CT orbit

	No.	%
CT orbit (n= 98)		
free	35	35.71
intra-orbital pellet	63	64.29

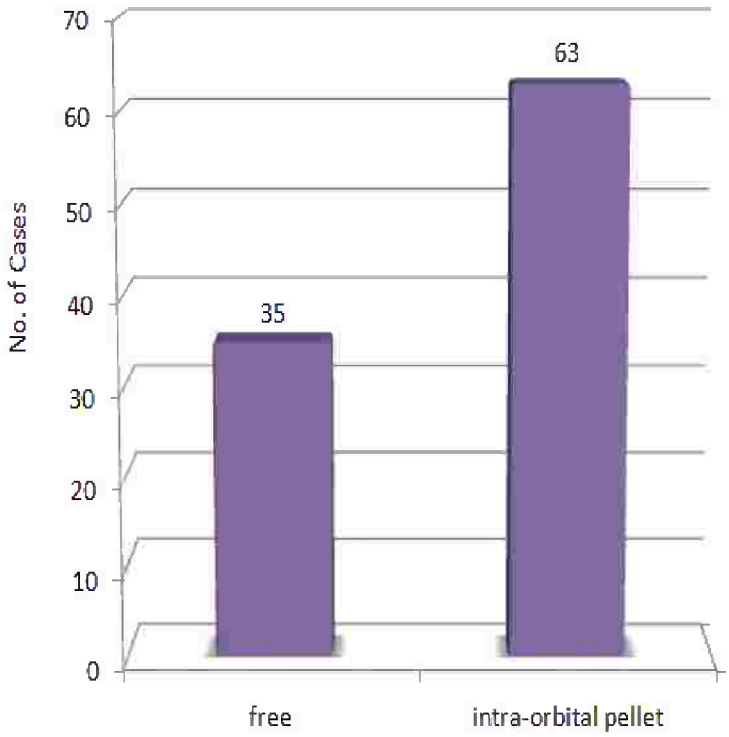


Figure (20): Distribution of the studied cases according to CT orbit.

VII. Distribution of studied cases according to duplex of extremities: (Table XI, Fig. 21)

Data obtained from the records told that 320 cases had limb injury. 500 limbs were injured and those devided into 257 lower limb and 243 upper limb. Only 192 duplex study have been done. Table (XI) shows that 76% of duplex cases was non-communicating hematoma, then greatly decreased in torn femoral artery (8.3%), torn popliteal & femoral artery (3.1%), torn popliteal artery (2.6%), then torn anterior tibial artery (ATA) (2.1%), torn axillary artery (1.6%). It was also noted that 6.3% were free.

Table (XI): Distribution of the studied cases according to Duplex

	No.	%
Duplex (n=192)		
Free	12	6.3
No DVT, arterial tree are patent with good color saturation and normal triphasic wave pattern, non-communicating hematoma	146	76
Torn ATA	4	2.1
Torn axillary artery	3	1.6
Torn femoral artery, ATA & PTA shows venous like flow	16	8.3
Torn popliteal & femoral artery, ATA & PTA shows venous like flow	6	3.1
Torn popliteal artery, ATA & PTA shows venous like flow	5	2.6

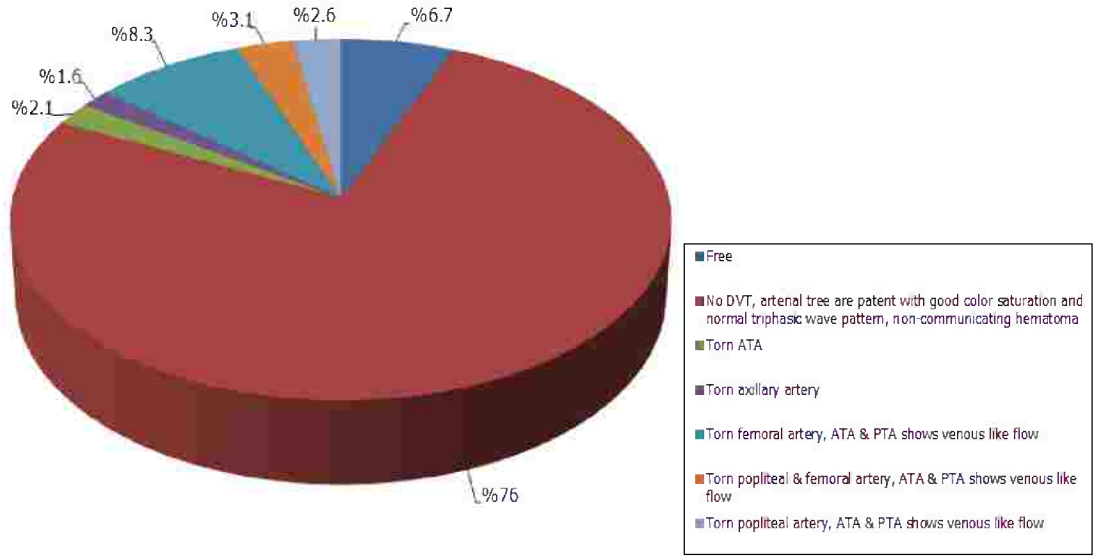


Figure (21): Distribution of the studied cases according to duplex.

B. Distribution of studied cases according to Medical and Surgical interference:

As regards to medical & surgical interference, it can be classified to major & minor interference. Major surgical interference include: repair of rupture globe, which record the highest rate (17.3%) followed by arterial exploration (9%) then Abdominal exploration (7.96%) then repair of amputation and fixation of vertebrae by (1.38%) and (0.35%) respectively.

The second group was minor interference include: sterile dressing (32.87%) followed by cold and hot dry compesses on eye by (9%) then stitching & dressing (8.6%). Inter-costal tube (ICT) insertion came next by (5%) followed by external fixation of leg (2.7%) then blaster of Paris (BOP) of fingers (2%) and debridement of wound with delayed repair of tendons take the lowest order by (1.7%).

Table (XII): Distribution of the studied cases according to medical and surgical interference

		No.	%
	Medical and Surgical interference (n=289)		
Major Interference	Repair of rupture globe	50	17.30
	Arterial Exploration	26	9.00
	Abdominal exploration	23	7.96
	Repair of partial amputation	4	1.38
	Fixation of vertebrae	1	0.35
Minor Interference	Sterile dressing	95	32.87
	Cold and hot dry compesses on eye	26	9.00
	Stitching & dressing	25	8.65
	ICT insertion & removal after improvement	15	5.20
	External fixation of Leg	8	2.77
	BOP of fingers	6	2.08
	Debridement of wound, stay suture with delayed repair of tendons	5	1.73
	Blood transfusion	5	1.73

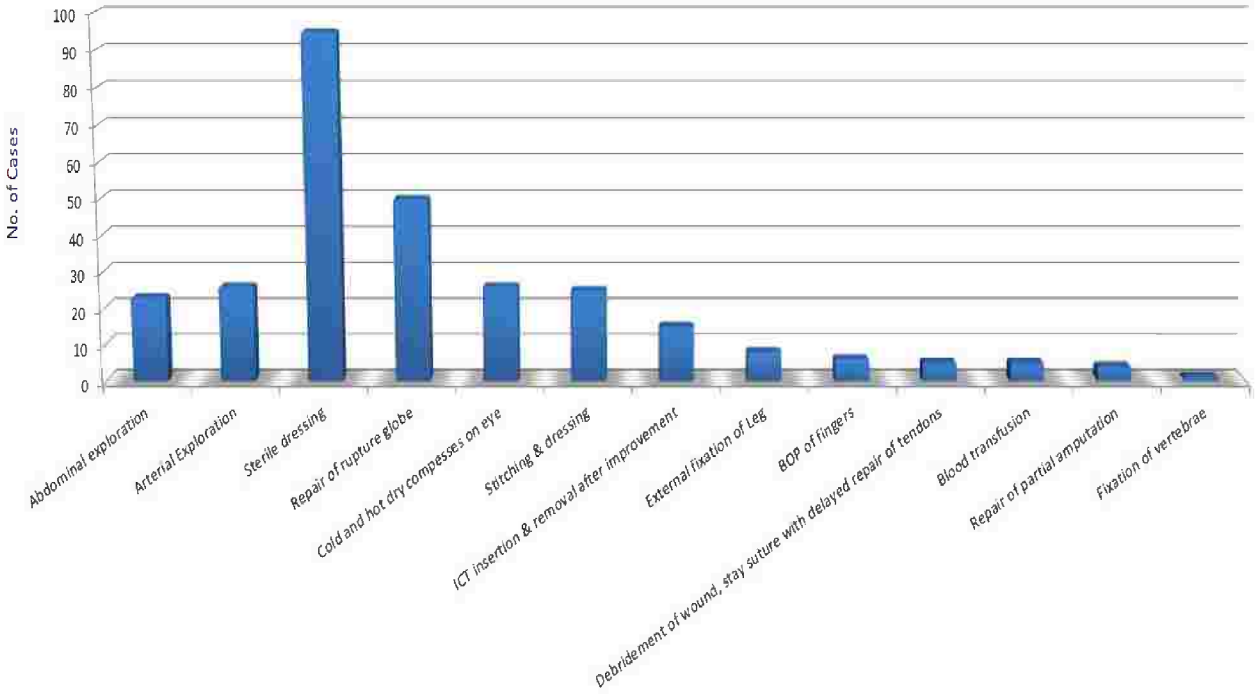


Figure (22): Distribution of the studied cases according to medical and surgical interference.

Table (XIII) shows the distribution of abdominal surgery among cases of abdominal missile injury. abdominal exploration & repair of liver tear was the most common abdominal surgery by (48%) followed by abdominal exploration & resection-anastomosis of transverse colon (22%) then abdominal exploration & repair of liver & pancreatic tear have the same order with repair of stomach, duodenum, jejunum by (13%). The last one was abdominal exploration & resection-anastomosis of transverse colon & repair of stomach & duodenal tear & removal of shattered kidney by (4%).

Table (XIII): Distribution of the studied cases according to abdominal surgery

	No.	%
Abdominal Surgery		
Abdominal exploration & repair of liver tear	11	48
Abdominal exploration & resection-anastomosis of transverse colon	5	22
Abdominal exploration & repair of liver & pancreatic tear	3	13
Abdominal exploration & repair of stomach, duodenum, jejunum, liver & pancreatic tear	3	13
Abdominal exploration & resection-anastomosis of transverse colon & repair of stomach & duodenal tear & removal of shattered kidney	1	4

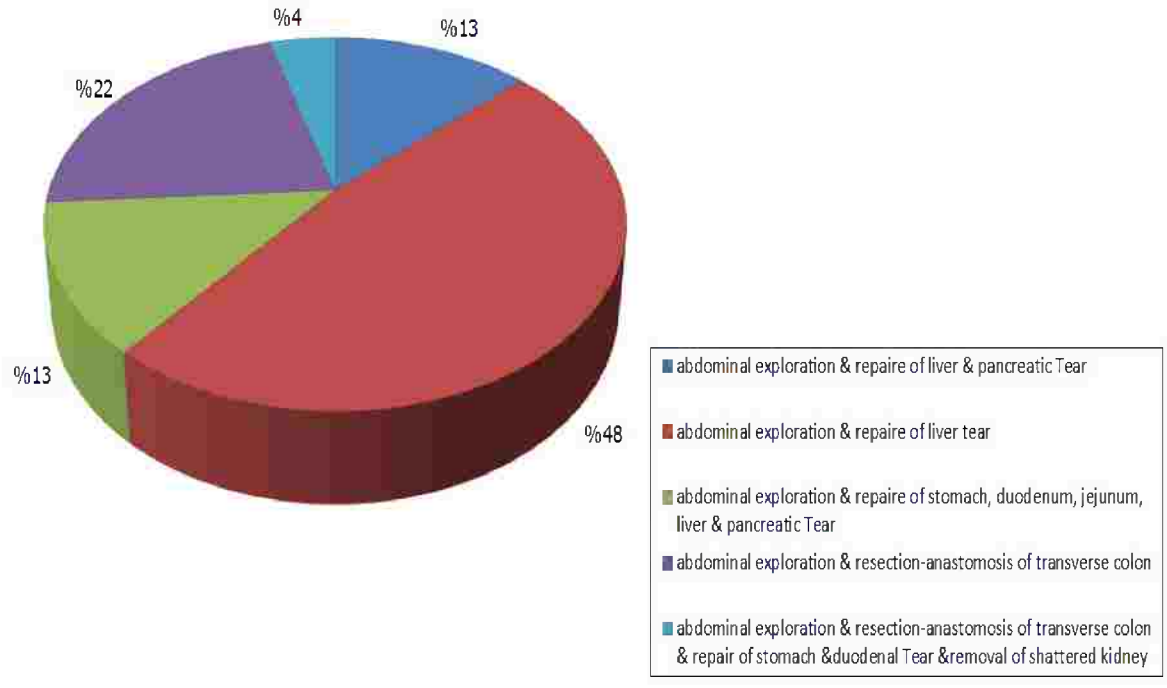


Figure (23): Distribution of the studied cases according to abdominal surgery.

Table (XIV) shows the distribution of vascular surgery among cases of vascular missile injury. Femoral artery exploration take the first order (46%) followed by supra-junical exploration (23%) then Infra-junical exploration (19%) and the last order was axillary artery exploration (12%).

Table (XIV): Distribution of the studied cases according to vascular surgery

	No.	%
Vascular Surgery		
Femoral artery exploration, repair by reversed saphenouse graft	12	46
Supra-junical exploration, repair of popliteal & femoral artery by reversed saphenouse graft	6	23
Infra-junical exploration, repair of popliteal artery by reversed saphenouse graft	5	19
Axillary artery exploration , repair by reversed saphenouse graft	3	12

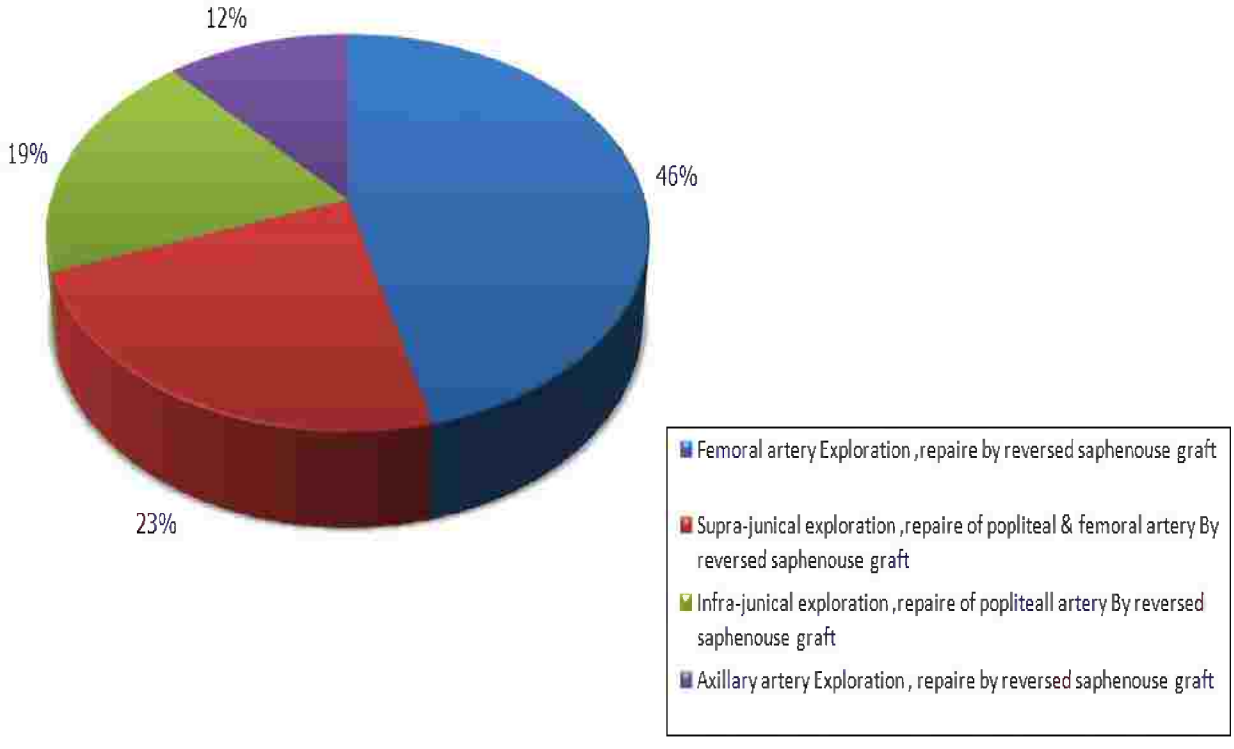


Figure (24): Distribution of the studied cases according to vascular surgery.

8- Distribution of studied cases according to outcome: (Table XV, Fig. 25)

Table (XV) shows that about 425 (84 %) patients of total 507 patients were discharged with morbidity, 13% discharged cured and the mortality was 3%.

Table (XV): Distribution of the studied cases according to outcome

	No.	%
Outcome		
Disability	425	84
No-disability	67	13
Death	15	3

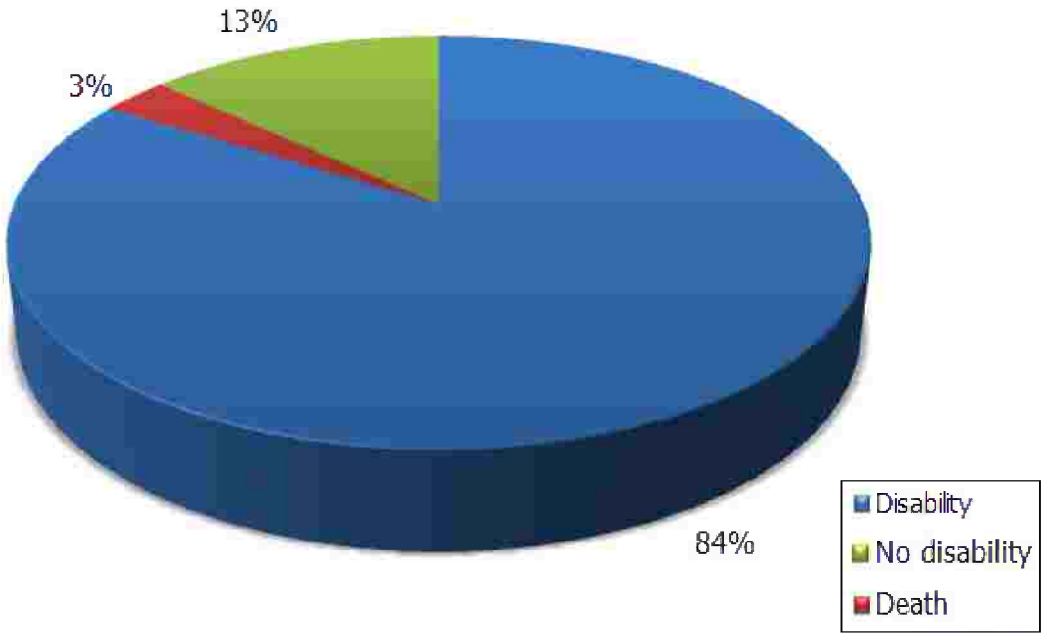


Figure (25): Distribution of the studied cases according to outcome.

9- Relation between age of patient and outcome: (Table XVI, Fig.26)

Table (XVI) shows that patient aged (20 - < 30) years are the highest group who had no disability (67.2%), then the second order were age group (30 - < 40) years (17.9%), and not occurred in group > 50 years. On the other hand, patient aged (20 - < 30) years were the highest group who were discharged with disability (48.7%), then were age group (10 - < 20) years (21.6%), then groups aged (50 - <60) whilest (> 60) were the lowest. As regards to death, patient aged (20 - < 30) years are also the highest group (66.7%), then were age group (10 - < 20) years (20%), and not happened for groups (30 - < 40) and > 50 years.

Table (XVI): Relation between age of patient and outcome.

	Outcome					
	No disability (n = 67)		Disability (n = 425)		Death (n = 15)	
	No.	%	No.	%	No.	%
Age						
10 - < 20	6	9.0	92	21.6	3	20.0
20 - < 30	45	67.2	207	48.7	10	66.7
30 - < 40	12	17.9	71	16.7	0	0.0
40 - <50	4	6.0	39	9.2	2	13.3
50 - <60	0	0.0	8	1.9	0	0.0
> 60	0	0.0	8	1.9	0	0.0

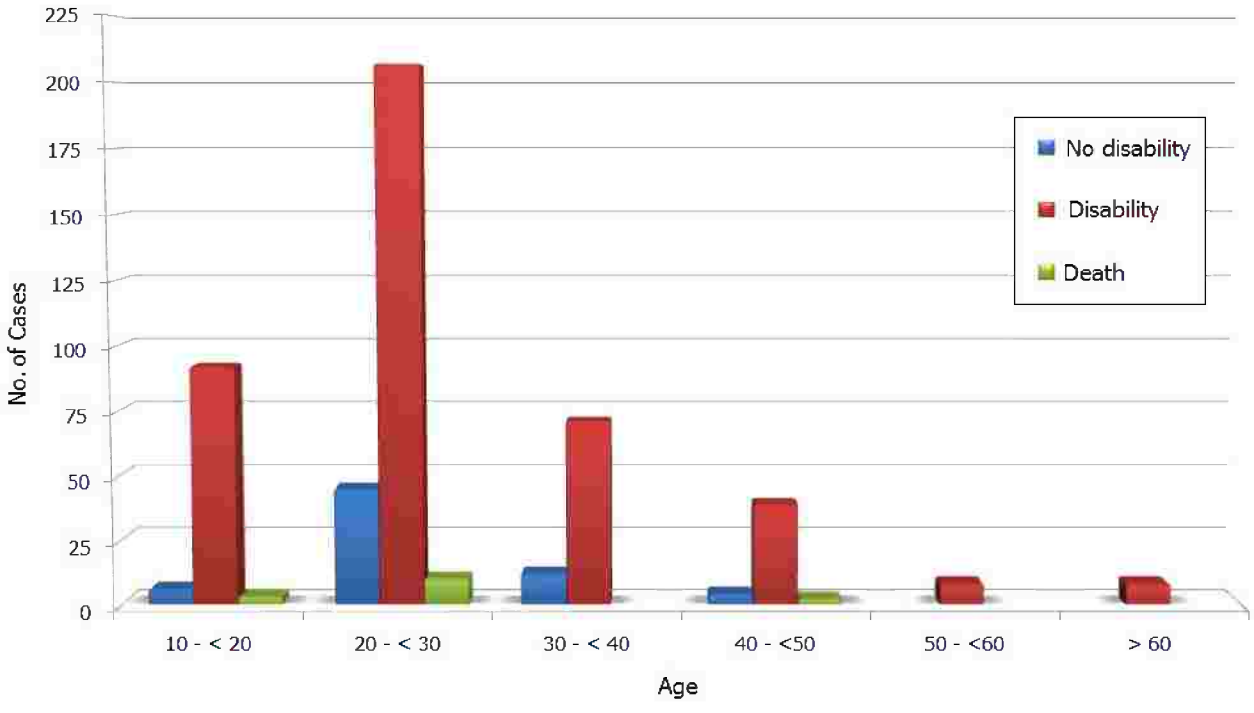


Figure (26): Relation between age of patient and outcome.

10- Relation between hemodynamic stability and outcome: (Table XVII, Fig.27)

Table (XVII) shows that 70.1% of patients who discharged with no disability were hemodynamically stable and patients discharged with disability, 96.7% of them were also hemodynamically stable. As regards to death cases all of them were hemodynamically unstable.

Table (XVII): Relation between Hemodynamic stability and outcome.

	Outcome					
	No disability (n = 67)		Disability (n = 425)		Death (n = 15)	
	No.	%	No.	%	No.	%
Hemodynamic stability						
Stable	47	70.1	411	96.7	0	0
Unstable	20	29.9	14	3.3	15	100

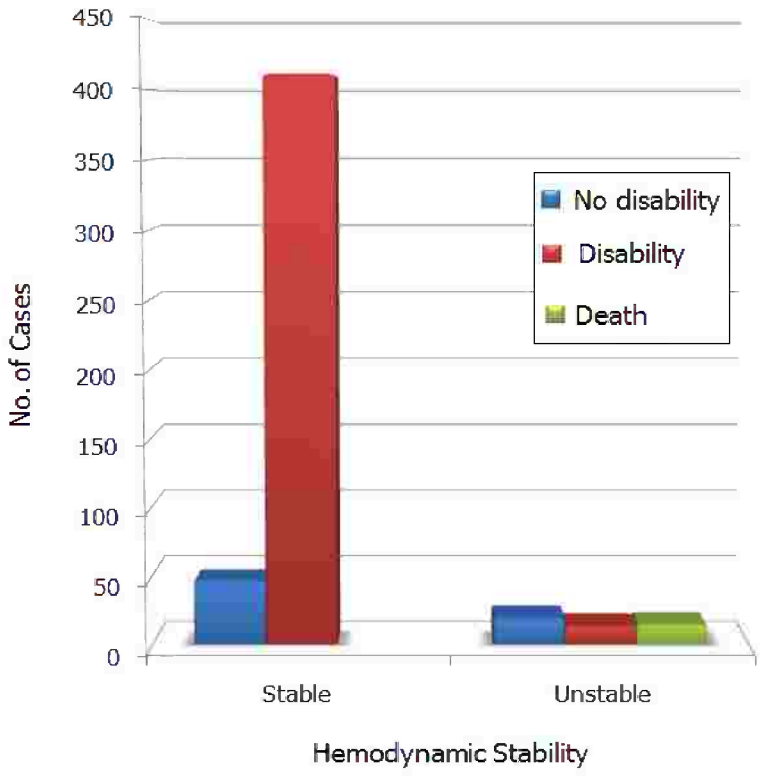


Figure (27): Relation between Hemodynamic stability and outcome.

11- Relation between medical and surgical interference and outcome: (Table XVIII XIX, Fig.28)

Table (XVIII) and (XIX) show that all patients undergo external fixation of leg, debridement of wound, and blaster of Paris (BOP) were discharged with no disability. As regards to cases who were discharged with disability, they can be categorized as follows: the first group was patients discharged with major disability (also called retained pellet with loss of function) & those who undergo repair of rupture globe, amputation & vertebral fixation (this occur in a case of fracture DV12, LV1, 2 which leads to complete cord transection & paraplegia). The second group of disability were those who have minor disability (also called retained pellet with preservation of function): as cases of embedded pellet superficially in the skin level in the scalp, neck, chest, abdomen & limbs with no further damage or cases of pellet impaction in the eye lid or intra-orbital pellet in a well formed eye globe and they did cold & hot dry compresses on their eyes, also cases of abdominal exploration which passed successfully. And cases of non-communicating muscular hematoma in the neck, shoulder, thigh & legs considered also minor disability.

As regards to death cases, they were 14 males & one female, their ages ranged from 19 to 40 years. 4 cases died due to craniocerebral missile injuries. 6 cases died due to abdominal missile injuries. One case died due to thoracic missile injury & 4 cases died due to missile injuries in multiple areas in the body.

Cases who died due to craniocerebral missile injuries, 3 of them arrived dead & one case died just upon arrival to hospital while he were given emergency support in casualty.

5 cases of death due to abdominal missile injuries arrived a life (one case arrived dead) but they were hemodynamically unstable, their GCS between 3-9 and BP were low or unrecorded with high pulse rate. They undergo abdominal exploration & repair, 4 cases died during the operation & one case remain a life but hemodynamically unstable & comatosed, she admitted to the ICU & stay there for 2 weeks & died.

One case died due to thoraco-abdominal missile injury. He received the stabilizing measures & undergo ETT (endotracheal tube) & ICT (intercostal tube) insertion & receive blood transfusion & admitted to the operation room were abdominal exploration had been done but he remain hemodynamically unstable & died within 3 days of admission.

4 cases of deaths had multiple missile injuries. Different body parts were involved & the cause of death varies between abdominal bleeding, injuries in the extremities including vascular insult, neck injuries, chest injuries or craniocerebral injuries. All of them arrived a life, they receive stabilizing measures & admitted to the operation room where different surgical procedures done & died within 1-3 days of admission.

Table (XVIII): Relation between medical and surgical interference and outcome.

	Outcome					
	No disability (n = 67)		Disability (n = 207)		Death (n = 15)	
	No.	%	No.	%	No.	%
Medical and Surgical						
Abdominal exploration	0	0	13	6.2	10	66.7
Arterial Exploration	25	37.3	1	0.5	0	0.0
Sterile dressing	5	7.5	90	43.5	0	0.0
Repair of rupture globe	0	0.0	50	24.2	0	0.0
Cold and hot dry compesses on eye	0	0.0	26	12.6	0	0.0
Stitching & dressing	5	7.5	20	9.7	0	0.0
ICT insertion & removal after improvement	11	16.4	4	1.9	0	0.0
External fixation of Leg	8	11.9	0	0.0	0	0.0
BOP of fingers	6	8.9	0	0.0	0	0.0
Debridement of wound, stay suture with delayed repair of tendons	5	7.5	0	0.0	0	0.0
Blood transfusion	0	0.0	0	0.0	5	33.3
Repair of partial amputation	0	0.0	4	1.9	0	0.0
Fixation of vertebrae	0	0.0	1	0.5	0	0.0

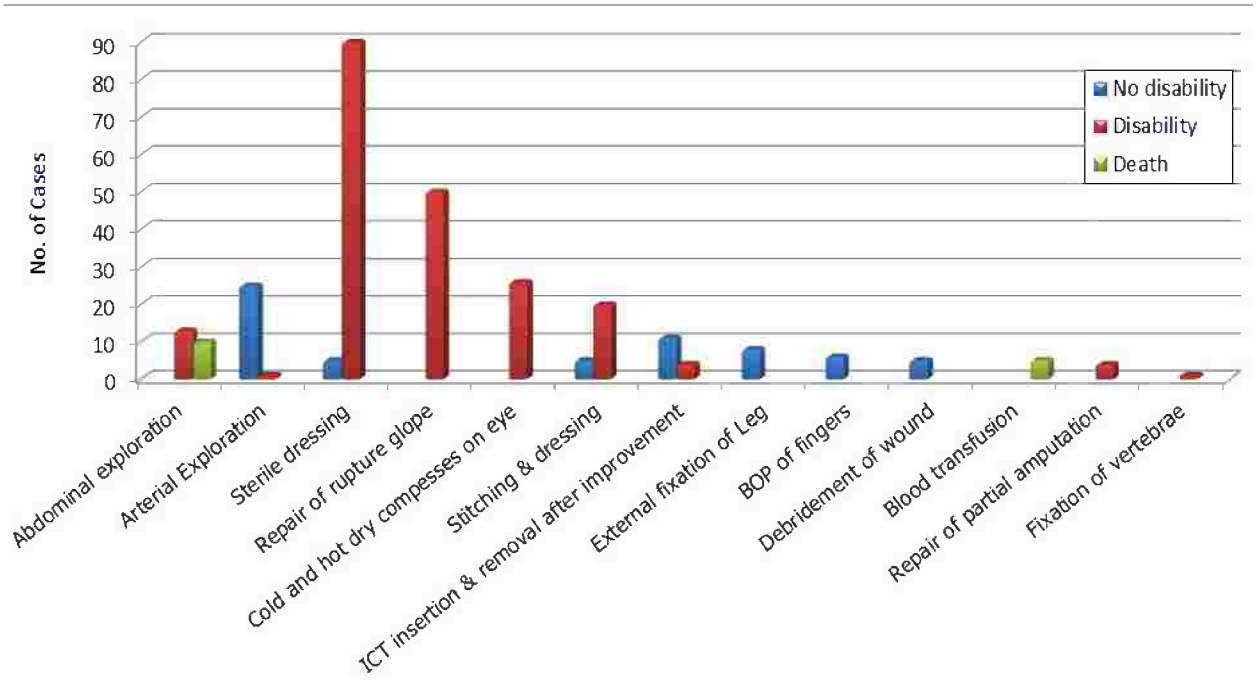
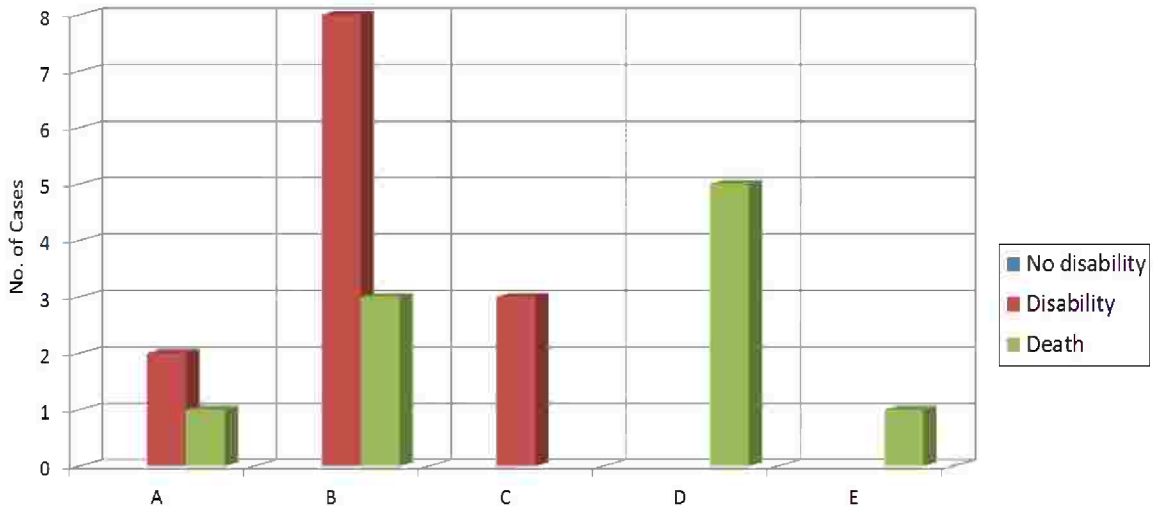


Figure (28): Relation between medical and surgical interference and outcome..

Table (XIX): Relation between abdominal surgery and outcome.

	Outcome					
	No disability (n = 8)		Disability (n = 5)		Death (n = 10)	
	No.	%	No.	%	No.	%
Abdominal Surgery						
Abdominal exploration & repair of liver & pancreatic Tear	1	12.5	1	20	1	10
Abdominal exploration & repair of liver tear	4	50	4	80	3	30
Abdominal exploration & repair of stomach, duodenum, jejunum, liver & pancreatic Tear	3	37.5	0	0		0
Abdominal exploration & resection-anastomosis of transverse colon	0	0	0	0	5	50
Abdominal exploration & resection-anastomosis of transverse colon & repair of stomach & duodenal tear & removal of shattered kidney	0	0	0	0	1	10



A	Abdominal exploration & repair of liver & pancreatic tear
B	Abdominal exploration & repair of liver tear
C	Abdominal exploration & repair of stomach, duodenum, jejunum, liver & pancreatic tear
D	Abdominal exploration & resection-anastomosis of transverse colon
E	Abdominal exploration & resection-anastomosis of transverse colon& repair of stomach & duodenal tear &removal of shattered kidney

Figure (29): Relation between abdominal surgery and outcome.

12- Relation between Glasgow Coma Score (GCS) and outcome: (Table XX, Fig.30)

Table (XX) shows that all patients with GCS score of 3 - 5 were died. All patients with GCS score 6 - 8 discharged with disability, for GCS score 9 - 12 all patient had no disability. For patients with a GCS score 13–15 there was a 13 % no disability and 87 % had disability.

Table (XX): Relation between Glasgow Coma Score (GCS) and outcome.

	Outcome					
	No disability (n = 67)		Disability (n = 425)		Death (n = 15)	
	No.	%	No.	%	No.	%
GCS						
3 - 5	0	0	0	0	15	100
6 - 8	0	0	4	1	0	0
9 - 12	4	6	0	0	0	0
13 - 15	63	94	421	99	0	0

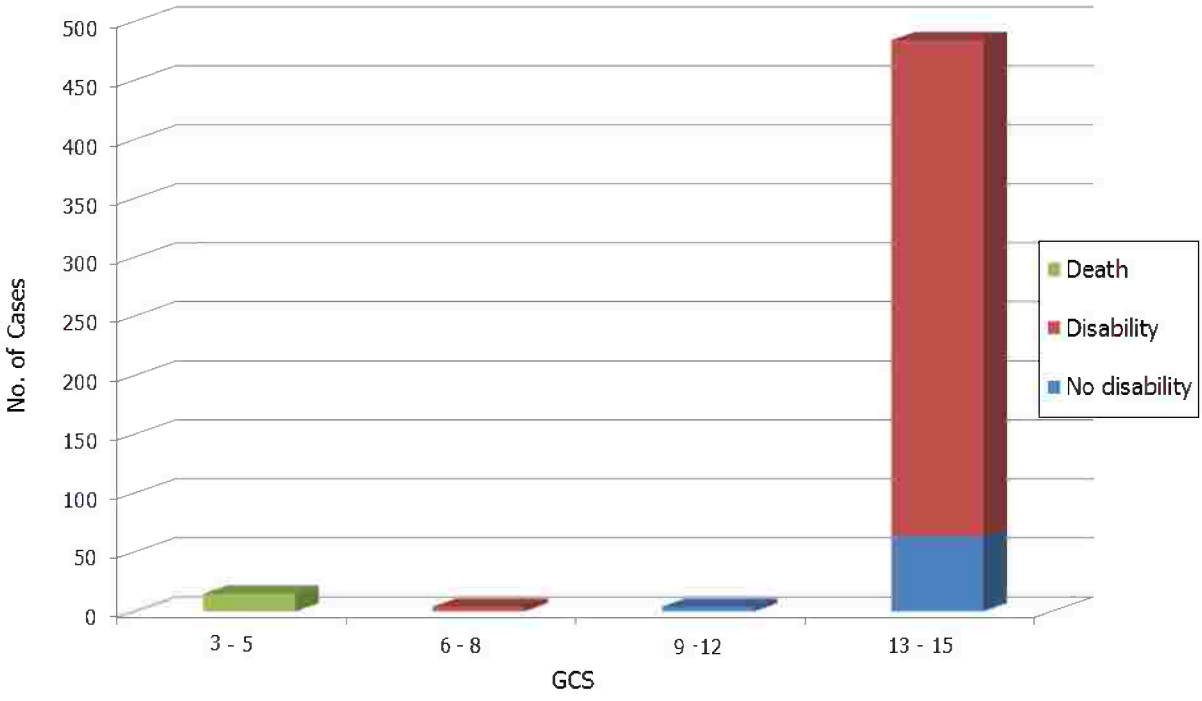


Figure (30): Relation between Glasgow Coma Score (GCS) and outcome..