SUICIDAL, HOMICIDAL AND ACCIDENTAL HANGING: COMPARATIVE CROSS SECTIONAL STUDY IN ALJABAL ALAKHDAR AREA, LIBYA.

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ABSTRACT

Introduction: Death by hanging may be suicidal, accidental or homicidal. General external appearances, local external neck findings, neck autopsy and neck histological changes play a major role in differentiation between types of hanging. **Aims & Objectives**: Differentiation among suicidal, homicidal and accidental hanging by using different diagnostic methods including naked eye examination, neck autopsy, examination of neck structure, and histopathological features of the neck structures at the ligation mark site. **Subjects and Methods**: the study was carried out from March 2018 to March 2019, with 36 cases of deaths due to hanging divided into: Group 1 (18 cases**)**: suicidal hanging**,** Group 2 (13 cases)**:** homicidal hanging and Group (5 cases): accidental hanging**.** A thorough external and internal examination of neck structure was performed in all the cases**. Results**: Suicidal hanging, associated with female sex, was detected in 57.1% of cases. Homicidal and accidental hanging, significantly associated with skin hemorrhage, was detected in 80% of cases. Microscopic examination: Breaking, wrinkling and compression of the skin along with micro hemorrhages in the subcutaneous tissues were notified more commonly with homicidal hanging. **Conclusion**: The examination of corpse in hanging cases becomes easy by correlating current observation with the autopsy finding. The correlation of external, internal and microscopic findings leads to easy formulation of final opinion of these cases. It also, to some extent helps to differentiate between types of hanging.

Keywords: Hanging; suicidal; homicidal; accidental.

I- INTRODUCTION

The term ‘‘hanging’’ describes a special form of compression on the neck. In contrast to manual and ligature strangulation, the pressure on the soft tissues of the neck results from the body weight exercising a pulling force at the hanging noose. Hanging deaths are frequently subject to forensic autopsy to clarify the manner of death. Considering that the most common type of hanging seen is suicide hanging, homicidal and accidental hanging are only rarely seen (Tattoli et al., 2014**).** However, the task of the forensic pathologist is to determine whether the person hanged him- or herself, and whether hanging occurred while the person was still alive, or if the decedent was placed in a hanging situation postmortem, e.g., as a masquerade to hide homicide and to simulate suicide. Both a medical history of psychiatric disorders and the existence of suicide note are used in differentiation **(**Buschmann et al., 2010). World Health Organization (WHO) in 2015, made a review of 56 countries, which found that hanging was the second commonest method of suicide in most countries, following poisoning. In some countries, such as Germany and Japan, hanging has been ranked as a leading method of suicide, while in India and United State of America, it is the second leading cause of suicide after intoxication and firearms

injuries, respectively (WHO, 2018). In uncivilized societies, the application of ligation for taking away the life of another person was one of the commonest practices, which were successfully carried out into civilized societies (Kumar, 2013**)**. Accidental hanging is rare, which leads to the difficulty of distinguishing its diagnosis from the diagnosis of suicidal and even criminal hanging. Accidental hangings have a common characteristic that causes death to unsuspecting victims. It concerns children as well as adults, mainly mistakes or in auto-erotic context (Nouma et al., 2016). In autopsies of strangulation cases including hanging, the important aspect of the post-mortem examination is the careful analysis of neck structures. These internal cervical findings (bruises in soft tissue, fracture in hyoid bone and/or thyroid cartilage) play a decisive role in the diagnosis of these cases (Vij, 2008). The aim of this study was analysis of hanging (suicidal, homicidal and accidental) cases which included naked eye examination, neck autopsy and histopathological features of skin at the ligation marks site.

II-SUBJRCTS AND METHODS

A prospective study was conducted on 36 cases of compressed neck by ligature due to hanging brought for autopsy to Judicial Experience and Research Center - Aljabal Alakhdar, Libya. All the information related to the circumstances was collected from the Police records and from the deceased's family members during period of 1st of March 2018 to 28th of February 2019.Both external and internal post mortem findings were observed very carefully with standard autopsy protocol. The study was approved by the institutional review board (IRB). Informed consent to participate was obtained from the relatives of each subject. The work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans, Patient demographics, including age, body mass index and size of reduction.

II.1: Inclusion Criteria: All cases died from hanging (suicidal, homicidal and accidental hanging) from both sexes and all ages with mean postmortem time of work from 2 hours to 24 hours after death.

II.2: Subjects included in the study:

This study was carried out on 36 cases of deaths due to hanging, which was subjected to medicolegal autopsy. The cases were divided into three groups: Group 1: cases of suicidal hanging (18 cases), Group 2: cases of homicidal hanging (13 cases) and Group 3: cases of accidental hanging (5 cases). The information regarding identification of the deceased, reason for committing suicide, place of hanging, material used, position of the knot, type of knot, whether it was a complete or partial hanging, any blood stains or disturbance, etc., at the scene of crime, history of any illness or drug intake, alcoholism, previous attempt of suicide, presence of suicidal note, etc. were enquired from the police and detailed interviews of the relatives of the deceased. The study of all cases included naked eye examination, ordinary autopsy, examination of neck bones, and the histopathological features of skin of neck at ligature mark site. Irrespective of the information gathered from the police records and accompanying relatives of the deceased, in all cases, both external and internal findings were observed meticulously during post-mortem examination to rule out any other cause of death. Complete perusal of all the records was done prior to medicolegal autopsy, which is a routine protocol in all cases.

II.3: Steps of performance:

After identification of the body, a careful search for any external injuries, dribbling of saliva, signs of asphyxia like bluish discoloration of fingernails, petechial haemorrhages, signs of sphincter relaxation, pattern and also any distribution of hypostasis, extent of rigor mortis developed, etc. were looked for. A detailed study of the Ligature mark was done.

Finally, dissection of neck was done step-by-step to observe the neck tissues structures beneath the ligature mark, after the thoracic organs and the brain had been removed. This allowed the blood in the neck to drain away, providing for a cleaner dissection field.

A protocol of Prinsloo and Gordon (1951) (a careful neck dissection, layer by layer) was

undertaken in the morgue. The neck was extended by keeping a wooden block under the shoulder with a midline incision of the skin, and subcutaneous tissue was reflected off the underlying anterior cervical strap muscles along the facials plane. The manubrium sterni was left intact at the beginning of the autopsy when the rib cage was removed so that the inferior attachments of the anterior cervical strap muscles remained unaltered.

Blood samples taken from the left chamber of the heart and tissue samples were collected for systemic toxicological analysis according to regular procedures. All samples were sent to the Forensic Science Laboratory, Judicial Experience and Research Center – Aljabal Alakhdar, Libya, to determine/rule out use of drugs, poison and ethanol. Toxicological results were not subject to investigation in this study.

Histopathological examination: A portion of the skin and subcutaneous tissue from the ligature site fixed overnight in formalin fluid and processed to prepare 5µm thick paraffin sections. These sections were submitted to Haematoxylin and Eosin (H&E) stain. Paraffin samples were cut using a Reichert-Jung 2030 microtome and examine microscopically by using Light microscope examination (Bancroft and Gamble, 2008).

II.4: Statistical analysis

Data collected throughout history, examination, and outcome measures coded, entered and analyzed using Microsoft Excel software. Data were then imported into Statistical Package for the Social Sciences (SPSS version 20.0) **(**Statistical Package for the Social Sciences) software for analysis.

According to the type of data qualitative represent as number and percentage, quantitative continues group represent by mean ± SD, the following tests were used to test differences for significance: a-Chi square test (X^2) for difference and association of qualitative variable .b-ANOVA for differences between quantitative independent groups. P value was set at <0.05 for significant results & <0.001 for high significant result.

III-RESULTS

III.1: Demographic data: Age and other demographic and basal characters distribution among studied group (N=36): The mean age was distributed as 25.47±10.93years; the age group with maximum incidence was 21-30 years. There were5 cases (3males and 2 females) in the age group (less than 11 years old), 7 cases (5 males and 2 females) in the age group (11-20years old), 13 cases (7 males and 6 females) in the age group (21-30 years old), 8 (5 males and 3 females) cases in the age group (31-40 years old), 3 cases (1 male and 2 females) in the age group (41-50 years old) with no cases in the groups above 50 years old**.** (58.3%) of cases were male and (66.7%) of cases were single (Table 1).

Suicidal hanging was significantly associated with female sex (61.1% of cases), singles (77.8% of cases) and at home (83.3% of cases). Homicidal hanging was associated with male gender (92.3% of cases), singles (61.5% of cases) and outside home (76.9% of cases) and accidental hanging associated with male gender in (40% of cases), singles (40% of cases) and outside home (60% of cases) (Table.2) (Figure.1 &2).

Table 1: Distribution of age and sex among studied groups:

Age group (in years)	Number of males	Number of females	Total
Less than 11	3	2	5
11-20	5	2	7
21-30	7	6	13
31-40	5	3	8
41-50	1	2	3
Above 50	0	0	0

Table 2**:** Comparison among suicidal, homicidal and accidental hanging as regards demographic and basal characters (sex, marital state and site of hanging) using ANOVA and Chi square tests.

Variable			Suicidal (n=18)	Homicidal (n=13)	Accidental (n=5)	F/χ^2	P
Age (mean± Sd)			25.06±11.31	27.08±10.23	22.8±13.07	F=0.29	0.75
Sex	Female	N	11	1	3	χ^2 9.67	0.008**
		%	61.1%	7.7%	60%		
	Male	N	7	12	2		
		%	38.9%	92.3%	40%		
Marital state	Married	N	4	5	3	χ^2 2.75	0.25
		%	22.2%	38.5%	60%		
	Single	N	14	8	2		
		%	77.8%	61.5%	40%		
Home/ Outside	Home	N	15	3	2	χ^2 11.67	0.003
		%	83.3%	23.1%	40%		
	Outside	N	3	10	3		
		%	16.7%	76.9%	60%		

N: number of cases , %: the percentage, χ^2: Chi square test, P: significance, Ns: Non significant, F=ANOVA test *significant (P< 0.05) **Highly significant (< 0.001)

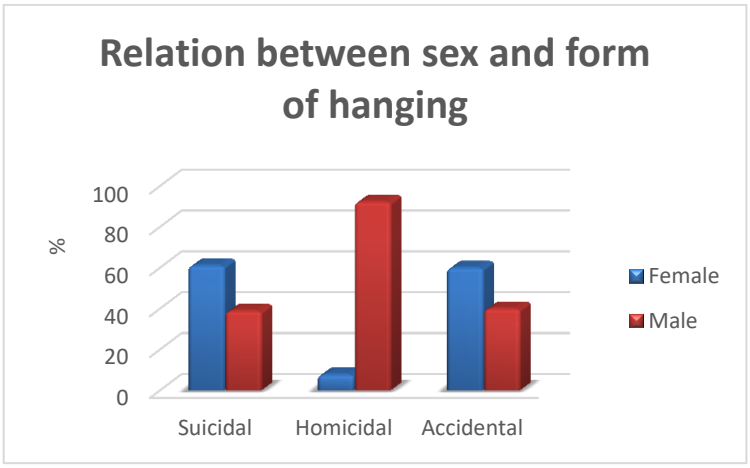

Figure 1: Relation between sex and forms of hanging among the studied groups

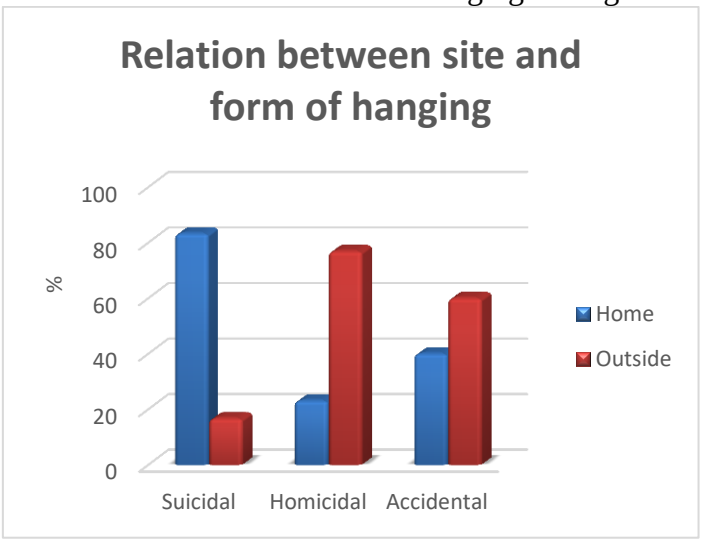

Figure 2: Relation between site of hanging and forms of hanging among the studied groups.

III.2 Skin finding distribution among studied group (N=36):

In suicidal hanging, skin haemorrahage was positive in 38.9% of cases, petechial hemorrhage was positive in 50% of cases, conjunctival hemorrhage was in 55.6% of cases and other periligature injuries were positive in 11.2% of cases. Homicidal hanging significantly associated with skin haemorrahage (84.6%of cases), petechial hemorrhage in 69.2%of cases, conjunctival hemorrhage in 61.5% of cases and bruises &scratches in 61.5% of cases. Accidental hanging significantly associated with skin haemorrahage (80% of cases), petechial hemorrhage in 60% of cases, conjunctival hemorrhage in 60% of cases and bruises & scratches in (20%) of cases (Table 3).

Table 3**:** Comparison of suicidal hanging , homicidal hanging and accidental hanging as regards skin finding using Chi square test.

Variable			Suicidal (n=18)	Homicidal (n=13)	Accidental (n=5)	χ^2	P
skin haemorrahage		N	7	11	4	7.51	0.02*
		%	38.9%	84.6%	80%		
Petechial hemorrhage		N	9	9	3	1.16	
		%	50%	69.2%	60%		0.56 NS
Conjunctival hemorrhage		N	11	8	3	0.12	
		%	55.6%	61.5%	60%		0.94 NS
Other findings	Scratches	N	1	0	0	29.85	<0.001**
		%	5.6%	0%	0%		
	Bruises	N	0	3	0		
		%	0%	23.1%	0%		
	Bruises & scratches	N	1	8	1		
		%	5.6%	61.5%	20%		
	Bruises & scratches &Defence marks	N	0	1	0		
		%	0%	7.7%	0%		
	Defence marks	N	0	1	0		
		%	0%	7.7%	0%		
	-VE	N	16	0	4		
		%	88.9%	0%	80%		

N: number of cases , %: the percentage, χ^2:Chi square test, P: significance, Ns: No significant

In autopsy finding in suicidal hanging, bleeding in the tissue was positive in 55.6% of cases, cut of muscles in 83.3% of cases, hyoid bone fracture in 22.2% of cases, thyroid fracture in 5.6%of cases, cricoid fracture in 5.6%of cases, cervical vertebra fracture in (5.6%) of cases and air way obstruction in44.4% of cases with no significant relation or association. In homicidal hanging ,bleeding in the tissue was found in 61.5% of cases, cut of muscle in 76.9% of cases, hyoid bone fracture in 38.5%of cases, thyroid cartilage fracture in 23.1% of cases, cricoid fracture in 15.4% of cases, cervical vertebra fracture in (7.7%)of cases and air way obstruction (53.8%)of cases (with no significant relation or association). In accidental hanging ,bleeding in the tissue was found in 40% of cases ,cut of muscle in 60% of cases, hyoid bone fracture in 20% of cases and air way obstruction in 40% of cases. no thyroid cartilage fracture, cricoid fracture ,cervical vertebra fracture was seen (with no significant relation or association) **(**Table 4).

Table 4: Comparison of suicidal hanging ,homicidal hanging and accidental hanging as regards autopsy finding using Chi square test

Variable		Suicidal (n=18)	Homicidal (n=13)	Accidental (n=5)	χ^2	P
Bleeding in the tissue	N	10	8	2	0.68	0.71
	%	55.6%	61.5%	40%		NS
Cut of muscles	N	15	10	3	1.24	0.54
	%	83.3%	76.9%	60%		NS
Hyoid bone fracture	N	4	5	1	1.17	0.56
	%	22.2%	38.5%	20%		NS
Thyroid fracture	N	1	3	0	3.07	
	%	5.6%	23.1%	0%		0.22 NS
Cricoid fracture	N	1	2	0	1.48	0.48
	%	5.6%	15.4%	0%		NS
Cervical vertebra fracture	N	1	1	0	0.41	0.82
	%	5.6%	7.7%	0%		NS
Air way obstruction	N	8	7	2	0.39	0.82
	%	44.4%	53.8%	40%		NS

N: number of cases %: the percentage.,+ve: positive.,-ve: Negative, χ^2:Chi square test, P: significance, Ns: No significant.

III.3 Relation between hanging type and ligation characters:

Regarding suicidal hanging, it was significantly associated with knot in left side of neck in 55.6% of cases, in right side of neck in 44.4% of cases and no occipital knots were found. There was one loop in half of cases, grooving was positive in 61.1% of cases and the commonest ligation material used was cloths (27.8% of cases). In homicidal hanging, knot in left side was founded in 38.5% of cases, in right side in 30.8% of cases at occiput in 30.8% of cases. Number of loops in cases of homicidal hanging commonly one loop (46.2% of cases), a groove was found in 61.5% of cases and the commonest ligation material used was metal wire (23.1% of cases). In accidental hanging knot was found in left side in 40% of cases, in right side in 40% of cases and at occipit in 20% of cases. Number of loops commonly one loop (80% of cases) and a groove was found in 40% of cases (Table 5) (Figure 3).

Table 5: Comparison of suicidal hanging, homicidal hanging and accidental hanging as regards ligation characters using Chi square test

Variable			Suicidal (n=18)	Homicidal (n=13)	Accidental (n=5)	χ^2	P
Side of knot	Lt.	N	10	5	2	6.20	0.19 NS
		%	55.6%	38.5%	40%		
	Occipital	N	0	4	1		
		%	0%	30.8%	20%		
	Rt.	N	8	4	2		
		%	44.4%	30.8%	40%		
N. of loops	1	N	9	6	4	11.36	0.18 NS
		%	50%	46.2%	80%		
	2	N	8	5	0		
		%	44.4%	38.5%	0%		
	3	N	1	1	0		
		%	5.6%	7.7%	0%		
	4	N	0	1	0		
		%	0%	7.7%	0%		
	5	N	0	0	1		
		%	%	0%	20%		
Groove		N	11	8	2	0.80	0.67 NS0
		%	61.1%	61.5%	40%		
Ligation material	Bed Sheets	N	0	0	1	37.79	0.04*
		%	0%	0%	20%		
	Belt	N	0	1	0		
		%	0%	7.7%	0%		
	Cloth	N	5	0	1		
		%	27.8%	0%	20%		
	Cotton rope	N	3	0	0		
		%	16.7%	0%	0%		
	Electric wire	N	3	1	0		
		%	16.7%	7.7%	0%		
	Hard metal wire	N	0	1	0		
		%	0%	7.7%	0%		
	Metal wire	N	1	3	1		
		%	5.6%	23.1%	20%		
	Nylon rope	N	2	1	1		
		%	11.1%	7.7%	20%		
	Plastic bag	N	0	2	0		
		%	0%	15.4%	0%		
	Plastic rope	N	1	3	0		
		%	5.6%	23.1%	0%		
	Scarf	N	3	0	1		
		%	16.7%	0%	20%		
	Swing rope	N	0	1	0		
		%	0%	7.7%	0%		

N: number of cases,%: the percentage,χ^2:Chi square test, P: significance, Ns: No significant

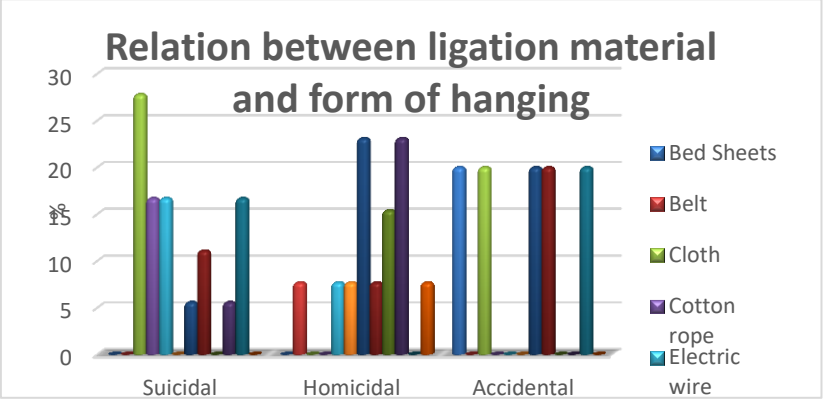

Figure (3): Relation between ligation material and forms of hanging among the studied groups

III.4: Suicidal, homicidal and accidental and other classifications of hanging:

In suicidal hanging, partial hanging was found in 44.4% of cases and complete hanging in 55.6% of cases, with significantly associated with atypical hanging(100%)of cases were no typical hanging was found. In homicidal hanging partial hanging was found in 15.4% of cases, complete hanging in 84.6% of cases, atypical hanging in 69.2% of cases and typical hanging was found in 30.8% of cases. Regarding accidental hanging partial hanging was found in in 20% of cases, complete hanging in 80% of cases, atypical hanging in 80% of cases and typical hanging was found in 20% of cases (Table 6).

Table 6**:** Comparison among suicidal, homicidal and accidental hanging as regards other classifications of hanging (partial hanging, complete hanging, atypical hanging and typical hanging) using Chi square test

Variable			Suicidal (n=18)	Homicidal (n=13)	Accidental (n=5)	χ^2	P
Complete/ partial hanging	Partial	N	8	2	1	3.31	0.19 NS
		%	44.4%	15.4%	20%		
	Complete	N	10	11	4		
		%	55.6%	84.6%	80%		
Typical/ atypical hanging	Atypical	N	18	9	4	6.16	0.04*
		%	100%	69.2%	80%		
	Typical	N	0	4	1		
		%	0%	30.8%	20%		

N: number of cases., %: the percentage,+ve: positive.,-ve: Negative., χ^2: Chi square test (X^2), P: significance, Ns: No significant

III.5: Histological findings

Hematoxylin and eosin (H&E) stained sections of the control group showed the normal histological structure of human thin skin. It's consisted of two main layers; epidermis and dermis. Epidermis is the external epithelial covering that composed of keratinized stratified squamous epithelium. Dermis is the underling connective tissue layer that included the skin appendages as hair follicles, sweat and sebaceous glands and blood vessels (Figure 4). Changes as breaking, wrinkling and compression were found. Congestion of blood vessels, hemorrhages and cellular infiltration were observed in this study. The microscopic features were uneventful in 16.6% of cases. In suicidal hanging group, the epidermis showed discontinuation, breaking and compression. The dermis showed focal congestion and dilated capillaries with edema. Breaking and compression were seen in the outer layer of epidermis, the dermo-epidermal junction showed areas of hemorrhage (Figure.5). In accidental hanging group, the epidermis showed breaking and compression. The dermis showed focal congestion and dilated capillaries with edema, the dermo-epidermal

junction showed areas of hemorrhage (Figure 6). The stained sections of homicidal hanging group showed epidermis with severe breaking and compression. The dermis showed severe congestion and dilated capillaries with edema, breaking and compression were seen more in the outer layer of epidermis, the dermo-epidermal junction showed areas of severe hemorrhage (Figures 7).

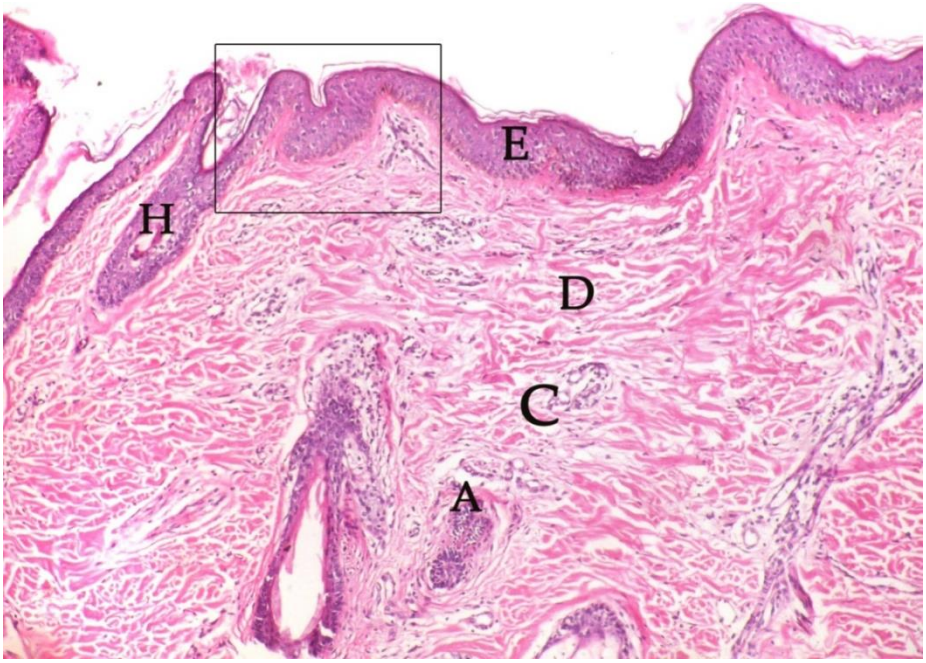

Figure (4): A photomicrograph of a section of a normal skin. It shows epidermis (E) and dermis (D).Dermis contains hair follicles (H) sebaceous glands (SG) and arector pili muscle(AR) (H&E ×100).

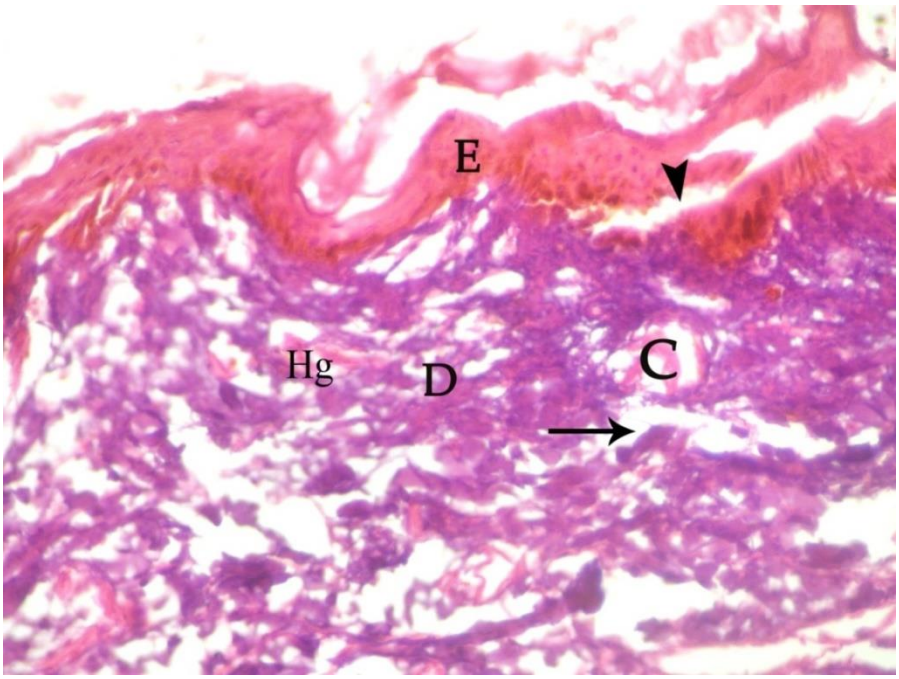

Figure (5): A photomicrograph of suicidal hanging group showing a section of skin from ligature site. It shows breaking and compression (arrowhead) in the epidermis (E), focal congestion and dilated capillaries (C), hemorrhage in dermo-epidermal junction (Hg) with edema (arrow) in dermis (D) (H&E ×400).

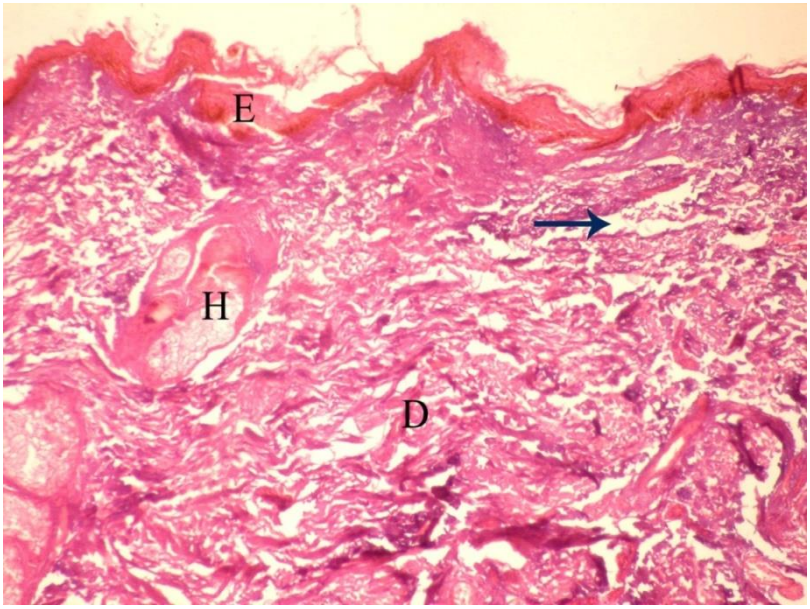

Figure (6): A photomicrograph of accidental hanging group showing a section of skin from ligature site. It shows breaking and compression (arrowhead) in the epidermis (E), hair follicles (H), focal congestion and dilated capillaries with edema(arrow) and sebaceous glands (SG) in dermis (D) (H&E ×100).

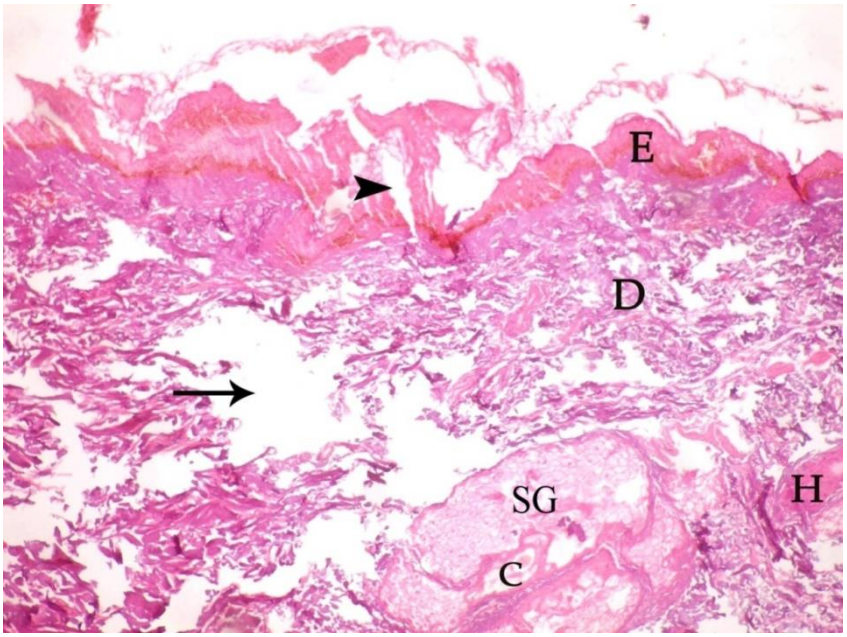

Figure (7): A photomicrograph of homicidal hanging group showing a section of skin from ligature site. It shows breaking and compression (arrowhead) in the epidermis (E),congestion and dilated capillaries (C) with edema (arrow) and hair follicle (H), sebaceous gland (SG) in dermis (D) (H&E ×100).

IV-DISCUSSION

When any case of hanging comes to the department of Forensic Medicine for post-mortem examination, the neck structures form the most integral part of the examination at autopsy table, as well as full investigation of the case to differentiate between different types of hanging (Ahmad and Hossain, 2010). Among these neck structures, hyoid bone and thyroid cartilages are the two important structures, which have to be studied in detail. Sometimes it becomes difficult to differentiate suicidal hanging from other forms of hanging especially in case of partial hanging where the ligature mark lies low in the neck, more or less in a horizontal manner. Therefore, the internal tissue damage helps to decide the actual manner of death. Similarly, in case of grossly decomposed bodies where the neck skin is grossly discolored or lost, it is

the internal damage to the neck tissue and hyoid bone, which tells the actual cause of death even months and years after death (Naik and Patil, 2005).

Deaths resulting from hanging and ligature strangulation show features amongst which the ligature mark at the neck is considered to be decisive. However, a characteristic finding, the ligature mark, found around the neck in both hanging and strangulation creates doubt in many cases (Shaikh et al., 2013).

Hanging may be suicidal, accidental or homicidal. However, as most type of hanging is suicidal one, the possibility of a non-suicidal death by hanging is sometimes taken into consideration only when there is clear evidence supporting this suspicion (Demirci and Dogan, 2011). Hanging is a form of violent asphyxial death in which the body is suspended by a ligature from above that constricts the neck and prevents entry of air into lungs. The constricting force is the weight of the body (Reddy, 2008). Sometimes the body is completely suspended from above, and this is called complete hanging. When some part of the body touches the ground, the procedure is called incomplete or partial hanging (Nandy, 2010).

A good number of people die each year by suicide, making it one of the 10 leading causes of death in the world accounting more than a million deaths annually (Mohanty et al.,2007)

In this study, deaths due to hanging were seen from 3years to 49 years of age. Maximum incidence was in the age group of 20–30 years, followed by the age group 30-40 years. Whereas in a study done by Sharma et al. (2005) ,young adults of the age group of 21-30years accounted for 46%, which is almost similar to the present study.

Maximum incidence observed by Kanchan and Menezes (2008) was in the age group of 30 – 40years.

For the present study, 36 cases of hanging are selected from 1st of March 2018 to 28th of February 2019. 58.3 % of them were males and 41.7% were females. Therefore, incidence of hanging was more in males when compared to females. In a retrospective study done by Sharma et al. (2005) the male: female ratio was 2:1.

On the other hand, our findings were in contrast to the findings observed by Ahmad and Hossain (2010), Saisudheer and Nagaraja (2012) ,where incidence of hanging was more in females when compared to males.

In the present study, 10 cases (55.6 %) did not show any skin marks, but in 16 cases (44.4%), injuries in the form of bruises, scratches and defence mark were seen. The reasons of the production of periligature injuries are knot mark contusions, fibres projecting from ligature material and/or the nail scratch marks inflicted by the struggling victim.

In the study conducted by Mohanty et al.(2003) ,injuries in the form of bruises, scratches and defence mark were seen in 23% of cases ,and in another study conducted by Tumram et al.(2010) ,defence mark were seen in 7% of cases.

In the present study, it was observed that all the cases, tissues underneath the ligature mark were pale and glistening with effusion of blood seen in 20 cases (55.6%). The commonest reason for effusion of blood was thatthe victims after tying the ligature around the neck took a long drop from the point of suspension.

Similar findings observed in the studies conducted by Nikolic et al.(2003) and Meera et al. (2011) were effusion of the blood into the deep tissues of the neck in 60% and 57% of the cases respectively.

On the other hand, our findings were in contrast to the findings observed by Saisudheer and Nagaraja (2012), where effusion of the blood was found in 30% of cases.

Rupture/contusion of sternomastoid muscle and/or other strap muscles wasseen in 77.8% of cases .Whereas in a retrospective study done by Sharma et al. (2005), injury to sternomastoid and other neck muscles was seen in 42% of cases.

In the present study, fracture of hyoid bone was observed in 10 cases (27.8%). The reason was thatthe fracture increases with age, high level of ligature mark on the neck, increased duration of suspension and with a thin hard ligature material. Whereas in a retrospective study done by Sharma et al.(2005), hyoid bone fracture was seen in 15% of cases, and

thyroid cartilage fracture was seen in 12% of cases.

In a study conducted by Feign (1999) , hyoid bone fracture was seen in 15% of cases.However,no hyoid bone fracture was observed by Üzün et al (2007).

The hanging deaths were taking different types in description as typical/atypical and complete/partial.

In the present study, complete hanging was seen in 11 deaths (30.6%). Partial hanging is taking lives mostly, which accounted for 25 deaths (69.4%).Whereas in a retrospective study done by Sharma et al. (2005), complete hanging was seen in 32% of cases and partial hanging in 68% of cases.

In the present study, typical hangingwas seen in 5 cases (13.9%) and atypical hanging was seen in 31 cases (86.1%).

In a study conducted by Sharma et al. (2005), typical hanging was seen more than atypical hanging.

Histopathological changes as breaking, wrinkling and compression were recorded and were found to correlate with the study done by Yadav and Gupta (2009) , where breaking (35.16%), wrinkling (46.15%) and compression (43.95%) was observed.

Congestion of blood vessels, hemorrhages and cellular infiltration was observed in thepresent study. In a study carried by Yadav and Gupta (2009), congestion (5.27%), hemorrhage (20.8%)and cellular infiltration (32.9%) were observed and showed in their study.

The microscopic features were uneventful in 6 cases (16.6%), and a similar observation was made by Yadav and Gupta (2009), where 18.6% of cases were uneventful.

Tissue reaction, if present indicates antemortem hanging. The absence of tissue reaction does not exclude antemortem hanging as described by Payne-James et al. (2003).

V-CONCLUSIONS

Majority of victims of suicidal hanging in this study were of single, females indoor using clothes as a tool followed by metal wire with increased incidence of cases in 20-30 years age group. Atypical hanging were more common in suicidal hanging .

Bleeding under skin, bruises and scratches accompanied by skin lacerations and compression of epidermis associated with and more sever in homicidal hanging.

VI-RECOMMENDATION

Further studies should be done to clarify the role of dissection of neck muscle , neck bones and blood vessels in differentiation between different types of hanging.

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الانتحار شنقاً ,القتل شنقاً والشنق العرضي : دراسة مقطعية مقارنة في منطقة الجبل الأخضرفي ليبيا

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يصف مصطلح "الشنق" نوعًا خاصًا من انواع الضغط على الرقبة. غالبا ما تخضع وفيات الشنق إلى تشريح الجثة الشرعي لتوضيح طريقة الموت. وبالنظر إلى أن الأسلوب الأكثر شيوعًا في الشنق هوالانتحار ، فغالباً ما يُنظَر الي أن القتل بالشنق و الشنق العرضي علي انها نادرا ما تحدث. **الهدف من البحث:** الهدف من هذه الدراسة هو التفريق بين الاشكال المختلفة للشنق وذلك عن طريق استخدام الطرق التشخيصية المختلفة للكشف علي انواع الشنق (الانتحار ، القتل العمد والعرضي).**العينات المستخدمة وطرق البحث:** أجريت هذه الدراسة على ٣٦ حالة من حالات الوفاة بسبب الشنق، التي تعرضت للتشريح الطبي الشرعي ، وقسمت إلى ثلاث مجموعات متساوية: المجموعة ١ (١٨ حالة): حالات الانتحار شنقاً.المجموعة ٢ (١٣ حالة): حالات الشنق القتل العمد المجموعة ٣ (٥ حالات): حالات الشنق العرض. واشتملت دراسة جميع الحالات علي الفحص بالعين المجردة ، والتشريح الطبي الشرعي للجثة ، ودراسة الخصائص النسيجية لانسجة الرقبة.**نتائج البحث** : عند تشريح الحالات وجد أن النزيف بأنسجة الرقبة موجود في (٥٥.٦ %) من الحالات ،القطع في أنسجة عضلات الرقبة في (٧٧.٨%) ،انكسار العظم اللامي (٧٢.٢%) من الحالات، وجود كسور في الفقرات العنقية للعمود الفقري (٥.٦%) من الحالات.نسبة النزيف في أنسجة الرقبة ٥٢.٤% من حالات الانتحار شنقا، بينما كانت (٦٠%) من الحالات في الأشكال الأخرى من الشنق. ايضامن خلال الدراسة وجد أن الشنق الانتحاري على علاقة ذات دلالة إحصائية مع شكل الشنق الغير النمطي . ولوحظ ايضاان التهتك والنزيف الدموي والاستسقاء وجدت في حالات القتل شنقا بصورة اكبر من بقية الأنواع الأخرى للشنق.**التوصيات:** الاستمرار في الأبحاث المتعلقة بالطرق التشخيصية للتفرقة بين انواع الشنق المختلفة مثل فحص عضلات الرقبة ،عظام الرقبة والاوعية الدموية .