

Divulging on Autopsy and the External Post-Mortem Examination of a Dead Body for Criminal Proceedings

Atika Lohani *

Shahid Zafar Bajwa †

Aamir Abbas ‡

p- ISSN: 2708-2458

Vol. V, No. III (Summer 2020)

e- ISSN: 2708-2466

Pages: 128 – 138

L- ISSN: 2708-2458

DOI: 10.31703/glsr.2020[V-III].16

URL: [http://dx.doi.org/10.31703/glsr.2020\[V-III\].16](http://dx.doi.org/10.31703/glsr.2020[V-III].16)

Abstract: *For criminal proceedings, the post-mortem examination of a dead body is composed of two stages. PME encompasses the apparent condition of the dead body in reference to the surrounding of the crime scene and the effects of the environment. The autopsy consists of the examination of the body in the autopsy room for detailed examination. Apart from these two categories, PME can also be divided according to the purpose and approval of authority for conducting the examination including; for the training of the medical students, organ donation, and identification of an unknown dead body where no crime is involved, or where the crime occurred it determines the cause of death or traces any sign of the criminal. The purpose of both examinations is to find the cause of death and trace the perpetrator of the crime, if possible under the given circumstances of dead body, and to prosecute the offender and exonerate the innocents.*

Key Words: Autopsy Examination, Autopsy Surgeon, Rigor Mortis, Livor Mortis, Dead Body

Introduction

External Post Mortem (hereinafter as PME) and autopsy are to find out the cause of death but for the intention of finding the cause of death, both play an equal role whereas the external PME goes one-step ahead when it is used to provide the traces of the perpetrator associated with the murder of that dead body. Autopsy examination does not aim at suggesting any finding or any trace of the accused person rather its focus is mainly to explore the cause of death. External PME differs from autopsy examination in reference to the concerned persons conducting them. The external PME is conducted by the Investigation Officer (I.O) and Medical Officer (M.O) on the crime scene and before the starting of the autopsy dissection whereas expert pathologist or autopsy surgeon always conducts an autopsy. The identification of the dead body can be recognized more efficiently in PME than in the autopsy. Process of external PME uses different traits of the dead body to identify it such as age, sex, teeth, length of hair, tattoos, birthmarks, pre-death injuries, and marks. Moreover, samples for scientific identification fingerprinting and samples of blood, semen and urine from the body are obtained for identification. If compared the autopsy to the external PME, it does not help in the identification of the dead body apart from blood or urine analysis and then matching with the central database. This can be performed before involving the autopsy under external PME. As far as the determination of the time of finding deadbody since death is concerned, external PME has more ways to estimate the death of the deceased such as Pallor Mortis, lividity, taphonomic change, Algor mortis, entomological changes, opacity of the cornea, and the outfits of body. However, the autopsy relies on fewer sources for estimating the time of death such as digestion of the food in the stomach etc. In support of the identification of the accused, the external PME employs different techniques such as examination of hands and nails, diseases and external Injuries, examination of the direction of blood, examination of setting up the death at the crime scene while the autopsy is incapable of finding the traces of accused. To find out the cause of the death, the external PME is corroborated by the report of the autopsy examination. Sometimes death is very complicated and cannot be detected by mere external PME of the body such as blunt blows on the abdomen or striking with a hard surface, heart attack, death by failure of any organ, death by any poison not showing external signs, death by suffocation etc. In these situations of death, external PME is unable to find the cause of death by observing the apparent condition of the dead body. That is why the usage of the autopsy is indispensable for knowing the exact cause of death.

In short, both of these examinations cannot be separated from each other. Each examination strengthens the other examination because the purpose of both examinations is to find the cause of

* Assistant Professor, University of Sargodha, Sargodha, Punjab, Pakistan. Email: dr.atikalohani@gmail.com

† Advocate High Court

‡ Assistant Professor, Law College, GC University, Faisalabad, Punjab, Pakistan.

death and trace the perpetrator of the crime if possible in order to prosecute that offender and save the innocents involved in the enmity and family disputes. No, any examination prevails over other examinations but is adopted together for one common aim.

Research Methodology

This is a qualitative study based on the black letter law approach for legal research focusing on descriptive and analytical legal research methods. The primary and secondary research data including case laws, books, journal articles, and websites on the topic has been analysed to write this paper.

Literature Review

The autopsy seems to be a term used for post-mortem but in fact, the post-mortem examination is a broader term and includes internal as well as the external examination whereas the autopsy is the internal examination for the legal purpose [\[Simpson, 2011\]](#). The question of preferring the autopsy to external post-mortem examination is confusing when the types of the post-mortem examination are under discussion. Both types play significant roles in finding out the cause of death in suicidal, accidental, homicidal, or natural deaths. Forensic pathologists who are expert and trained physicians in the study of abnormalities and diseases conduct an autopsy. Sometimes they take the assistance of autopsy technician or staff called Dieners or helpers (Gerbis 2010). Diener's literal meaning is "servant of the dead". The important question arises whether the external post-mortem is less significant if compared with the autopsy which is an internal post-mortem examination consisting of dissection of the body. To answer this, In some circumstances, the autopsy is beneficial whereas in some conditions external examination is more beneficial it depends on the nature of the death.

Categories of the Post-Mortem Examination

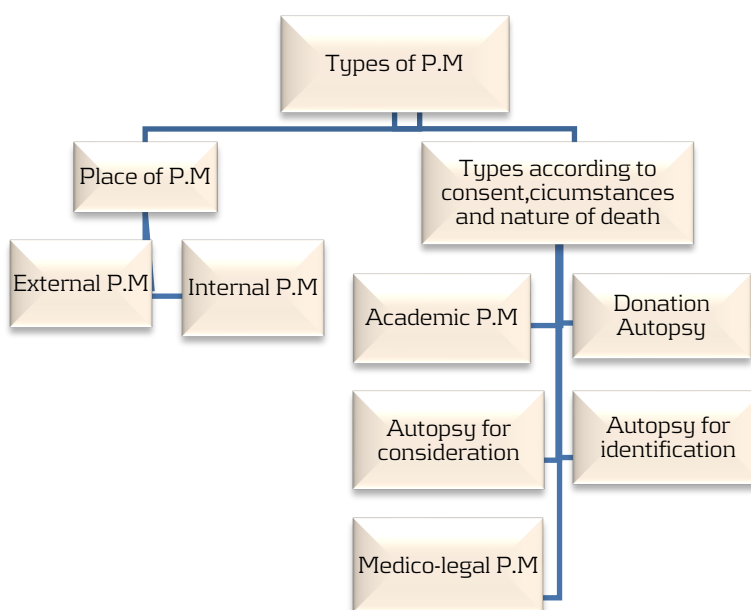


Figure 1.

Considering the figure above, there are two types of post-mortem examination according to a place where the examination is conducted irrespective of the aim of finding out of the cause of death.

- External examination
- Internal examination (Autopsy)

Post-mortem examination can be divided into different categories motivated by the consent, circumstances and nature of death such as

- Academic post-mortem examination

- An autopsy of hospital admitted bodies
- Autopsy for donation
- Autopsy for consideration
- Identification of the deceased
- The forensic medico-legal post-mortem examination

Below is the brief discussion of these categories as mentioned above in the flow-chart.

Academic Post-Mortem Examination

This type of post-mortem is conducted without any criminal background activity. In this examination, the autopsy is performed with the consent of legal heirs or guardian or caretaker if a person is dead or with the permission of dying person if he is alive at the time of consent. The forensic scientist should rely on written consent instead of oral or verbal consent. The basic purpose of this examination is to do research in the cause and effect of any disease by which the patient has died [Burton 2002]. Where the doctors are unable to understand and treat a particular disease therefore, to understanding nature, cause and effect of disease on the human body, they need further research [Shojania et al 2003]. In these circumstances, the heirs of deceased shall donate, or deceased himself has consented to the hospital doctors or to the medical college for the training and education of the students or deceased has earlier consented to donate the body prior to his death. Sometimes the consent is conditional on the consent of the heirs of the deceased such as in a case the father of the deceased son gave consent only for the permission of the autopsy not for retaining the organs such as brains in a formalin jar for the training and education of students [Shibley vs. City of NY 2015].

The Autopsy of Hospital Admitted Bodies

In this sort, of autopsy of the hospital admitted patient who has died as result of any treatment or negligence of any doctor, the forensic pathologist conduct the autopsy but before doing it he should have a discussion with a physician who was in charge of the treatment of the patient about the circumstances under which patient died. Autopsy surgeon should allow the presence of the concerned medical surgeon in the autopsy room but it is very important that the physician should not participate in the course of action of an autopsy [Waters 2009]. Autopsy surgeon should capture photographs of different parts and organs in different stages of dissection because when he has to prepare autopsy report he can refresh his memory moreover these photographs can be used for the corroboration of the evidence in the court if the court needs a further deep examination of medical evidence. Another autopsy surgeon, who has to appear in the court instead of concerned autopsy surgeon in the state of his death during the trial proceedings, can also be used for understanding the detail of autopsy. This material plays a vital role in the later examination of the body for second post-mortem examination or for teaching purposes of the medical students. If there is haemorrhage from any wound or injury, the photographs should be taken before evacuating the blood from the body [Waters 2009].

Autopsy for Donation

In this type, the legal heirs and guardian after the death of the deceased person and deceased himself or herself before death can donate any one or more organs to the needy person to improve any patient's health.

Autopsy for Consideration

This autopsy is like the examination of the dead body like the second kind but in this type, the donee has to pay consideration to the donor or his heirs for the donation of any organ. Consideration can also be involved if heirs of the deceased give the consent for autopsy.

Identification of the Deceased

This post-mortem is conducted for the identification of the dead bodies in the circumstances of accidental or suicidal death when the identity of the deceased is unknown to the investigative bodies. In this form, there is no criminological background and no criminal activity is involved such as the death of suicide, death by accidental fall in the river, death by suffocation, death by heart failure, death by accidental collision with train or any vehicle etc. In this type, autopsy may or may not perform.

A Forensic Medico-Legal Post-Mortem Examination

This sort is also called medico-legal autopsy. This category of examination is conducted on the opening of the inquest by the coroner, investigation officer, a magistrate, or a judge, a warden in the United States, a procurator fiscal in Scotland when there is suspicion of any criminal activity with the dead body. In this form of examination, Investigation Officer(hereinafter as IO) takes charge of the dead body on behalf of the state and hands over the dead body to the forensic pathologist for detailed autopsy of the dead body in order to find out the cause of death including any tracing of the perpetrator of the crime if possible. In this autopsy, the consent of legal heirs, guardian or any family member is not required. Only consent of legal authority is sufficient. During this examination, different articles recovered from the body of the victim are sealed in separate plastic envelopes or bags and sent to different experts for its analysis such as to the fingerprinting expert, the ballistic experts, the chemical examiner, the serologist, and the forensic scientist. If a person is found to be connected with the commission of the crime, the circle of the investigation becomes limited to that person avoiding the investigation of the population at the general. All concerning reports including medico-legal reports are sent to the court for the trial of a perpetrator of the crime.

Scope of the External Post-Mortem Examination

In this category of examination of the dead body, an examination of the external condition of the dead body is conducted whereas; the dissection of any part of the body is not included in this category. The examination of the teeth after cutting of cheeks by scalpel (Dictionary 2018) under the influence of Rigor mortis comes under external post-mortem examination. In this examination, the apparent condition of the body in reference to the effect of the environment such as weather or temperature on body, contamination and surrounding of the body are taken into consideration. In the death by the strangulation the pressure marks on the neck caused by gallop, hanging arrangements, chair or platform used for standing, the fan used for hanging, gallop used for strangulation are taken into consideration. In the homicidal cases, the manners in which body is found, any articles whether food or other stuff found nearby, the apparent condition of the body, any weapon found nearby the body are considered. External PME continues until the first cut carried out by the forensic pathologist. From the first cut the scope of the autopsy starts. Unlike internal examination, which is always conducted in the autopsy room by the expert medical officer, this examination can be conducted both on crime scene where dead body is found as well as in the autopsy room (surgery room) on the autopsy table but the medical officer should be expert in this respect because in the cross-examination his evidence can be discredited such as Mr. Ehrich in *State of Louisiana vs. Jimmy Hatfield* (2014) admitted in the cross-examination that he has no expert knowledge and training in the field of LM and P.M ([State vs. Hatfield 2014](#)).

Important Elements in an External Post-Mortem Examination

Conducted by the Police and Medical Officer

Unlike autopsy which is always carried out by only a forensic pathologist or autopsy surgeon who are expert in the knowledge of treating diseases, PME type of the examination may be conducted by the investigation officer (Hereinafter is called IO) as well as medical officer (Hereinafter is called MO) on the crime scene and in the autopsy room. It is always conducted before starting of internal examination of the dead body. At this stage, photographs are taken by the Investigation officers for maintaining the record whereas in the examination room by the MO Any abnormalities should be captured in the close-up mode such as an entrance and exit of the bullet, incised or stabbing wounds, any blow on the head, laceration wound on any part of body, severance or amputation of any organ of the body. The photographs are taken with a high-resolution camera with the help of an expert photographer. Some medical officers are also very expert in capturing the required photo according to their curiosity and expertise. The photographer should capture the photograph of a bleeding wound before cleaning the blood of the wound.

Identification of Dead body

The relatives, family or friends or any person acquainted with the deceased identify a dead body. In the situation of recovery of the unknown dead body, the finger impressions of the body are taken for matching and non-matching with the National Data Base for the purpose of identification. In order to identify a dead body other characteristics and traits of the body are also taken into notice such as Sex, age, complexion, race, length of hair on various parts of the body, tattoos, marks, and birthmarks found on the body. Any pre-death deformities of the organs of the body for example wholly or partially

amputation of any organ or limb of the deceased person should be examined. Old and new cuts, bruises, and abrasion occurred on the fingers of the dead body should be differentiated and examined.

Teeth of the Dead Body

For recording the age and identification of a body, teeth play a vital role because teeth last for a longer time even in the situation of exhumation of dead body secretly buried, teeth can be a good source to identify the deceased. Sometimes in thermal injuries, the body becomes charcoal but teeth do not decompose and can be examined [Dix 2000]. Any artificial treatment used for the teeth such as metal caps on any tooth, scars and injury marks on the surface of the body are noted. In some instances, a person uses metal caps engraving an alphabet on every tooth these alphabets sometimes give clue to his name or his pet name [Dix 2000].

Tattoos of a Dead Body

Tattoos differentiate a person from another person. In present days people mostly youngsters are very keen to draw a different type of tattoo on their bodies. An enquiry from the tattoo artist can be considered, as artist might be able to identify his customers because many tattoo artists keep the record of their customers. Some customers are their regular customers who used artist's services regularly. In some situations, single tattoo without having special distinction feature such as the name or date of birth does not provide much help but a set of different tattoos in a particular order appears to be different from the other person so tattoo artist can identify their customers very quickly. For instance, a girl got a set of tattoos on her shoulder, a small wooden hut; some ducks in the lake nearby, a skull on top of the hut, a witch staring through the red window on a scared child standing outside the hut. This unique set of tattoos is not very common so the tattoo artist or anybody who have seen that girl can easily remember her.

Samples for Identification

For the identification, an autopsy is not required if these characteristics of a dead body are unable to provide the identity of a dead body, therefore the samples of the blood, chemical, saliva or semen can be acquired for from the body without dissecting the body. These samples are sent to the different forensic experts for illustration to the DNA analyst for DNA matching and to the fingerprinting experts for fingerprinting matching. They analyse the acquired samples and match the results with the central national database system. Sometimes because of dryness of the skin of the fingers, it is difficult to remove the upper skin of the finger for taking the impressions or the fingers can be dipped in the alkaline solution for softening the fingers. If fingerprinting expert is still unable to take an impression, the fingers are cut and sent to the laboratory for obtaining the impression.

MO should also examine the natural orifices such as nose, mouth, ears, urethra, vagina, penis, and anus; he should collect the samples of any unusual change from the normal condition. Sometimes, UV radiations are used for enhancing the secretion of the chemicals from these openings [Valdes and Kinger 2018].

Estimation of time of Death of a Deceased

Time of death can only be assumed considering different factors, it cannot be determined with certainty and accuracy unless there is an eyewitness to the occurrence or any CCTV evidence to the incident. However, the forensic pathologist can estimate the time of the death. It also depends on the interval between post-mortem and the commission of the crime and finding of the dead body on the crime scene. Dr. Carter is of the opinion that the pathologists cannot estimate the time of the post-mortem interval which plays important role in determining the time of death [State vs. Swearingen 2015]. Determining the time since death depends upon some physical signs of the dead body and conducting the investigation. Finding the dead body in suspicious conditions, the IO starts the investigation of fact about the victim's presence on a particular place and any of his friends, family member, or any person saw him live last time in the surrounding of the crime scene or at the local area in which the deceased was residing. If the crime scene area, surrounding, or residing area are monitored by CCTV camera, the last seen time can be known by checking the record of footages. The opinion of the pathologists is not able to inform of the exact time of the death of deceased but opined the duration of one time to another time in which death occurred. In order to determine the death, they observe different chemical changes in the body after death [Waters 2009]. The pathologist considered the different apparent change in the result

of chemical changes. Variable changes for estimating the time comes under the limits of external PME because these changes can be observed without performing the autopsy of the dead body.

Pallor Mortis

It is the changing condition of the dead body and happens immediately after the death of a person notwithstanding the fact of sex being male or female. In this condition, the blood capillary circulation stopped working and the colour of the skin becomes pale. This condition can be observed within 15 to 25 minutes from the death. This condition can be noticed only in the hospital admitted bodies where patients are under treatment and doctors can get immediate notice of this transformed condition in recent death [[Schäfer 2000](#)]. The colour of the body changes into pale because of non-supply of the blood in the body.

Livor Mortis

The Livor Mortis (hereinafter as LM) is also known as post-mortem lividity, hypostasis or dependent lividity (Dictionary 2018). This condition is a change of colour of the body after the death of a person. Lividity has a purplish colour of the body parts where the body is laid on the floor after the ceasing of blood circulation [[Massie vs. State 1997](#)]. This change happens as when the human heart stops working and pumping the blood to circulate through the body. Due to heart stops pumping, the blood pooled in the lowest points of the body such as if a person is laid on the floor with his back flat on the floor, it can be seen at the back of the body, heels, elbow, and fingertips [[Dix 2000](#)]. The blood flows to the dependant vessels and becomes deoxygenated [[Waters 2009](#)]. This activity can be due to the flow of blood under the effect of gravity. After the death, these effects of gravity do not appear immediately rather they can be seen within some hours. Once these appear their visibility is possible in bright day light in the start of 30 minutes to one hour, however, as the time passes after a couple of hours an observer will be able to notice it even in poor light. Within one to two hours, the colour of skin become bluish and spotted or apathy. In the duration from five to six hours, blotchy turns into merged surface and skin become white if the skin is pressed on that point, and turns it into bluish colour when pressure is released from that place. From ten to twelve hours, the colour doesn't change if the skin is pressed on that point because in at that stage the LM has been fixed and don't change the colour on applying pressure on it as the blood cells are fixed there. If the position of the body is changed, the blood changes its position but when the Livor is finally fixed [[Dix 2000](#)], the movement in the position of the body does not affect the Livor. If any scalpel applies for cutting, a yellow fat can be seen but there will be no bleeding [[Dix 2000](#)].

Significance of LP in the Criminal Justice System

LM helps in confirming the fact of death. It also finds out the movement of the dead body from the place of occurrence to the place of disposing of the body in order to conceal it from the public for keeping crime secret. The condition appears in all type of body notwithstanding the fact of preservation of the dead body in cold storage when a stored body is exposed to the air [[Dix 2000](#)].

Rigor Mortis

Rigor mortis (hereinafter as RM) is a taphonomic change and called post-mortem rigidity. This condition happens in the dead bodies after the death, as lividity and RM after the death are indicative of the fact that death has occurred sometime earlier [[State vs. Scheffield, 2017](#)]. In this condition, the joints and muscles of the body become stiffened. It is the result of the less supply of oxygen such as energy in the form of adenosine, tri-phosphate and glycogen for the fibre muscles. This change may be noticed in small muscles parts of the body such as hands and cheeks. RM starts from two to four hours and completely developed from four to ten hours or 12 hours in cases as it depends upon ambient of temperature [[The People vs. Ubaldo Sanchez 2016](#)]. Forensic pathologist Manuel Montez in *State of Illinois vs. Nathaniel R. Legore EGORE* [[State of Illinois vs. LEGORE 2013](#)] testified in the court that if ambient temperature in cool, in this situation RM appears after a long delay [[State of Illinois vs. LEGORE 2013](#)]. It is the result of a chemical change in the body. Dr. Nolton H. Bigelow, in *Blaikie vs. Callahan* [[Blaikie vs. Callahan 1982](#)] testified in the court that rigor roughly starts in two to four hours continues from 24 to 48 hours. In this changed condition, it is very difficult rather probably impossible to change the position of the dead body in order to fix it in a small well because of the rigidity of the muscle of body under rigor mortis however; it can do it before the starting of this chemical change [[Blaikie vs. Callahan 1982](#)]. When RM is over; the stiffness fades [[Beachum vs. State 2017](#)]. It can connect the murder with the murderer where the only couple of people are living in a home and it is impossible the presence of the third person

[[Thompson vs. State 2015](#)]. If the body of the victim is under the influence of RM, it is fruitless to revive him with the help of CPR because it happens after the death of a victim [[State vs. Rawlins 2007](#)].

Elements Affecting Rigor Mortis

Joseph Guileyardo, a forensic pathologist pointed out that many factors affecting the speed of the rigor mortis. If a surgeon becomes aware of all factors in this condition, the time of the death cannot be determined [[Margaret Faye Litchfield vs. The State of Texas 2017](#)]. RM happens from top to down and depends on some variables such as in hot temperature or fever it sets and leaves early whereas in cold temperature it takes more time to leave it. It happens irrespective of death whether sudden or slow, natural or unnatural. In the situation of mass muscles such as in the case of muscular man, its effect is stronger than old weak woman is [[State vs. Poteat 2011](#)]. This phenomenon can be observed by opening the jaws when a medical officer has to examine the teeth and mouth of the dead body for determining the age and identity of the deceased. The medical doctor can cut the cheeks for examining of the teeth. RM can only provide an estimation of the time of death, not the accurate time or certainly [[Simpson, 2011](#)]. In some rare cases, the RM condition has been observed even up to 50 hours [[Simpson, 2011](#)].

Algor Mortis

Algor mortis (hereinafter as A.M) is also called post-mortem cooling. This condition is the rate of cooling of the human body after the death [[The People vs. Jammie Henrix 2007](#)]. The human being has warm-blooded bodies. After the death, the systems of body ceased working and body gets cooler gradually. This condition determines whether the death is recent or has taken some time. It is the temperature of the body in relation to the temperature of the environment. If the temperature of the body is warm, it indicates that death is recent whereas cold body temperature shows of death before a considerable time.

Elements Affecting Algor Mortis

Many factors and variable affects on the temperature of the body in reference to the outer temperature such as covered by winter dress, blanket, adipose deposits, and shelter, continuously contact with cool, cold, warm air and water. Moreover, LM and RM are more common in cool bodies.

Entomological Changes

The dead body attracts the flies on the open wounds and other delicate parts such as genital, mouth, and eyes [[Waters 2009](#)]. The flies lay eggs on the dead body. When the body and open wounds are exposed to the open environment, the flies are attracted to the body as flies can find the body immediately. The flies lay eggs on open places and delicate parts such as the mouth, vagina, penis, anus, ears, eyes, open wounds, and injuries. In one day, the flies are hatched on different parts of the body. The development of the eggs consists of three stages [[Australian Museum 2015](#)]. At the early, stage of the larvae the hatches takes place for 24 hours this is the first moult which feeds on the fluid such as saliva, semen, blood or wetness coming from the body. This moult also migrates inside the body through these open parts. At the second stage of larvae and develops a maggot. The duration between the first moult and at the second stage is 24 hours. At the third stage of the larvae, it becomes bigger in mass and size. The development reaches the pre-pupa stage after 48 hours. At this development stage, the pupa leaves the body and finds a suitable place for the development for pupation. It may be a soil nearby the dead body. In this condition, the pre-pupa does not feed and after four days pre-pupa transforms into the pupa. The maggots are the main feeding stage of the flies who consumes the flesh from the delicate parts of the body. The maggots consume the flesh leaving bones without flesh. The entomologist who is an expert about the development, life cycles of the flies determines the life of the maggots in reference to the dead body. The dead body found in the open places attracts flies more quickly. Dr. Jeffrey Tomberlin says that to attract flies to the dead body is highly variable and very usual that even in the warm temperature if compared to the cool, the body attracts the flies even after the elapse of several days after the exposure to the open place [[Ex Parte Swearingen 2009](#)].

The Opacity of the Cornea

In this condition, the opacity of the corneas of both eyes is blurred within three to four hours. Before the being blurred, the condition was transparent. This condition is also called autolysis of the cornea. If corneas are not blurred when IO reaches the crime scene, it indicated the recent death.

The Outfits of Body

The outfits of the deceased and other stuff with him such as any food or any articles bringing from home can also give an idea of the time since death. If a worker, going to workplace with her lunch box, was murdered in the judge on way to the factory. The IO and MO should try to get as more information as they can do. The custody of the food and its inspection can determine the time of the death. These articles can help in the identification of the deceased person and can also provide any trace of the perpetrator of the crime.

Obtaining Samples from Outfits

The condition of the clothes or outfit including stains of blood, mud, oil, fluids, and chemicals on the dress and body should be noted. The tearing, loss of buttons or disarrangement should be taken into consideration this condition indicates the scuffle between the victim and the perpetrator prior to the victim's death such as in the case of rape. Samples of the stains of blood, semen and vomit should be taken for examination by the chemical examiner, serologist, and forensic scientist for finding a match with the central database system.

Identification of Criminal

The external PME can trace the identity of the perpetrator of the crime whereas autopsy does not trace the identity of the criminal. For the identification of the traces, MO and IO have to observe dead body under the circle of external PME.

Examination of Hands and Nails

Both hands of the dead body should be examined. If there is an article in the hands of the dead body, it should be taken into custody as evidence. Sometimes in case of rape, deceased had scuffled with the rapist and during the condition of resistance, some articles belonging to the rapist clenched in the hands of the victim. Sometimes, the epithelial or the skin of the offender is also found in nails. Samples of skins should be collected and sent to forensic laboratory for the analysis and matching of DNA with the central DNA database to find the accused person. Other elements such as dust in the nails should also be examined because any foreign bodies such as stuffed coal in the nails of the victim not matched with the surrounding of the crime scene. Rather it connects the crime scene with nearby coal factory and the IO can include the persons relating to the nearby coal factory in the investigation for finding out the real culprit.

Diseases and External Injuries

Any diseases such as surgical emphysema, skin diseases and allergies, oedema or dropsy of legs, Icterus and fever should be taken into consideration. External injuries such as abrasion, bruises, wounds, burns, scalds and scratching of hair from different parts of the body should also be examined. The pathologist should differentiate between pre and post-death injuries. Injuries can also be a source of identification of deceased as well as traces of criminal as evident in a case of an elderly woman was sexually assaulted and murdered by continuously hitting by the criminal from his long boots ([Dix 2000](#)). The impression of the boots by using the fingerprinting powder and matching with the size of the same shoe soles using in the locality can limit the circle of investigation from a large number to few numbers.

Examination of the Direction of Blood

The direction of the blood should also be examined. It gives the idea of the direction of the attack and the disposal arrangements of the body from the place of occurrence to the place of disposal of dead body.

Examination of set up the death at the Crime Scene

Many factors in the situation of the case of death by the hanging or strangulation should be examined and noted. These include marks around the neck of the deceased, position of the body hanging with the gallop, the type of the knot and type of the material of the material. The arrangements may point to some fact so note taking about manners in which hanging is affected such as using of a chair, table or any other platform is helpful. Moreover, it is important to note the possibility of ability in arranging stuff for suicide such as the table is heavy enough not to be supposed by a very old and infirm old woman to drag from the expected position to the present position.

Scope of the Autopsy Examination

In this type of examination, dissection of the dead body and organs are involved. This examination is only performed by the forensic pathologist or autopsy surgeons who are very senior and expert in the knowledge of diseases and their treatments because any small mistake in preparing the autopsy report can create a doubt in the prosecution case [*Muhammad Pervaiz vs. State 2005*]. If the autopsy is not performed immediately, the body should be preserved in the refrigerator in the morgue [*Dix 2000*]. In this situation, the body should be sealed in a new body covered plastic bag for avoiding the chances of the contamination of the body [*Dix 2000*].

Consent for Autopsy

This examination is always conducted with the permission of the heirs or on the request by the concerned authority such as coroner, IO, magistrate or a judge, in the case of criminal activity related to the body.

An Autopsy by the Ordinary Medical Officer, not a Pathologist

Autopsy examination conducted by an ordinary MO and the medico-legal report prepared by that officer have no value and can be discredited in the cross-examination during the trial. This type of report also allows the accused person to challenge it and request for second post-mortem examination [*Amir Khan vs. District Magistrate Chakwal 1998*].

Death without Apparent Traces

A fatal blow on the abdomen lacerating the liver can cause the death without showing any external signs on the body and this type of death cannot be detected during external post-mortem examination [*Dix 2000*]. Likewise sometimes, there is haemorrhage in the sub-scapular when a small child's head was struck with any solid surface but he did not fall on the floor. In this condition, external injuries are not present on the head but internal injuries were present in the head [*Dix 2000*]. The insertion of the big rod from anus or vagina damaging and lacerating the vital organs cannot be detected by observing the appearance of the body but with the help of autopsy, the cause of death can be determined. In these blunt injuries, the autopsy can play an important role. Sometimes used too much force can cause death without showing any external signs [*State vs. Brown 2017*]. The *Com. v. Morris* (*Com. v. Morris 2008*) is indicative of the fact that without external injuries or signs a murder may be committed and even autopsy surgeon are unable to detect the sign of homicide (*Com. v. Morris 2008*).

Comprehensive and Detailed Examination

A comprehensive inner examination of the dead body will find the exact cause of death with preparation and arrangements for the death by the executor such as give an intoxicating drink before committing the murder. The internal examination, if compared to the external PME, gives details and accurate cause of death of the deceased person.

Determining the time of death by the Condition of Digestion of the Food

The condition of the food present in the stomach of the deceased person can also be used for the determination of the death. Human digestive system digests the food about six to eight hours and the digested food reaches the small intestine. The digesting timing of the food depends on different factors such as the age of the person because the old and weak person will take longer time in digesting the food whereas a young man will digest it within the short span of time even 3-4 hours. It also depends on the work or exercise routine after eating the food. The habit of chewing the food to chew well and longer will make the system digest the food very quickly. If food is not chewed well it will take a longer period to detect the exact timings of the death, as stomach has no teeth and stomach has to work hard and use a longer period to digest the food. The quantity of liquid used during eating, the quantity of food, and the nature of food also affect the working of the digestive system [*Chuckrow 1997*].

Element Controlling the Efficiency of the Autopsy Conducted by Expert Autopsy Surgeon

This examination is very important and must be carried out by the forensic pathologist and expert autopsy surgeon who have specialization in pathology and autopsy. Examination conducted by the

ordinary medical doctor having no specialization in pathology and autopsy is an unauthentic and unreliable piece of evidence.

The Opening of a Dead Body

The body is placed on the dissection table; it is supported by body blocks [Saukko and Knight 2016]. The body is opened in different shapes such as “Y” in which skin is opened from the ears and dissection is vertical in the abdomen [Saukko and Knight 2016]. Y style is mostly used In the United States [Saukko and Knight 2016]. In other “U”, shape opening the body is opened in U form; this style is normally used for the examination of the body of a child. In the examination, autopsy surgeon open the entire body but the legs and arms are not required. The bones’ cage is cut by the handsaw or mechanical saw. Dieners can help him during the operation of the dead body. All the parts of the body are examined. When autopsy surgeon opens the body, he can have an idea where is the cause of death of deceased for example if a person is shot with a firearm he can have the idea, which vital organ is damaged. The autopsy of the brain is not conducted because it is very complicated and can last for few weeks whereas ordinary examination of other organs consists of 4 to 5 hours.

Removing the Vital Organs and Detailed Examination of the Organs

The forensic scientist removes the vital organs and weighs. Different organs such as larynx, various arteries, oesophagus and ligaments are cut and detached liver, heart, brain, lungs including other important organs such as spleen, kidneys and reproductive organs for further examination. Signs of the burning of the rashness of internal parts will show the signs of death by administering any poison. The examination of the kidneys and urine will show whether intoxicated liquid was administered to the victim before committing his murder.

Conclusion

To conclude it is to argue that the relevant investigation and medical officers should be engaged in the process of examination and preparation of report of medical expert evidence. The difference in scope of autopsy and PME is important for legal purposes so that the probative value of reports of experts could be judged in accordance with rules of just and fair criminal trial. Both investigation and medical officers must be aware of the scope and limitations of their duties, obligations, and responsibilities as such with reference to their further testimony in the court proceedings.

References

- Amir Khan vs. District Magistrate Chakwal*, PLJ 1998 LHC 276.
- Australian Museum. (2015). *Decomposition: Fly life cycle and development times*.
- Beachum vs. State*, (Tex. App., 2017).
- Blaikie vs. Callahan*, 691 F.2d 64 (C.A.1 (Mass.), 1982).
- Burton E. C. (2002). The autopsy: a professional responsibility in assuring quality of care. *American journal of medical quality : the official journal of the American College of Medical Quality*, 17(2), 56-60. <https://doi.org/10.1177/106286060201700203>.
- Chuckrow, R. (1997). *The Intelligent Dieter's Guide*, Rising Mist Publications, Briarcliff Manor, NY.
- Com. vs. Morris*, 958 A.2d 569, 2008 PA Super 235.
- Dix, J. (2000). *Color Atlas of Forensic pathology*, 1st edn., Washington, DC.
- Ex Parte Swearingen*, (Tex. Crim. App., 2009)
- Margaret Faye Litchfield vs. The State of Texas*, No. 06-17-00007-CR, *Court of Appeals Sixth Appellate District of Texas at Texarkana*, 2017.
- Massie vs. State*, 349 Md. 834, 709 A.2d 1321 (Md., 1997).
- Merriam-Webster. (2018). *Medical Definition of livor mortis*.
- Muhammad Pervaiz vs. State*, PLJ 2005 Cr.C.1088.
- Nicholas Gerbis, (2010). *What exactly do they do during an Autopsy?* Life Science. (2018)
- Saukko, P., & Knight, B. (2016). *Forensic Pathology*, 4th edn., New York, p. 19-21.
- Schäfer, A. (2000). Colour measurements of pallor mortis. *International Journal of Legal Medicine*, 113(2), 81-83. <https://doi.org/10.1007/pl00007713>.
- Shipley vs. City of NY*, 16 N.Y.S.3d 1 (NY, 2015).
- Shojania, K. G., Burton, E. C., McDonald, K. M., & Goldman, L. (2003). Changes in rates of autopsy-detected diagnostic errors over time: a systematic review. *JAMA*, 289(21), 2849-2856. <https://doi.org/10.1001/jama.289.21.2849>.
- Simpson, C. K. (2011). *Simpson's Forensic Medicine*, 13th ed., London.
- State of Illinois vs. Nathaniel R. LEGORE*, 2013 996 N.E.2d 148.
- State vs. Brown*, 158 A.3d 501 (Me., 2017).
- State vs. Hatfield*, 155 So.3d 585 (La. App. 4 Cir., 2014).
- State vs. Poteat* (N.C. App., 2011).
- State vs. Rawlins*, (Tenn. Crim. App., 2007).
- State vs. Scheffield*, (2017). *Ohio* 2593.
- State vs. Swearingen*, (Tex. Crim. App. 2015).
- The People vs. Jammie Henrix*, B190607, *Court of Appeals of California, Second Appellate District, Division Three*, 2007.
- The People vs. Ubaldo Sanchez*, H040503, *Court of Appeal of the State of California Sixth Appellate District* 2016.
- Thompson vs. State*, 2015 Ark. App. 486 (Ark. App., 2015).
- Valdes, R., Kiger, P. J., (2018). *How Autopsies Work*.
- Waters, B. L. (2009). *Handbook of autopsy practice*, 4th edn. United States.