

Evidencing of Fire Arm Injuries – A Constraint to Access Criminal Justice

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Abstract

Forensic science plays an integral role in the Criminal Justice System. Forensic science can be used in almost any criminal case. The results of fire arm injuries related investigation are often detailed in a forensic report. These reports are often used for several purposes, including billing, affidavit's and as a proof of what was found or not found. The expert opinions and reports to various Courts in India and abroad under the Indian Evidence Act, which were sometimes highly appreciated, accepted and acknowledged for accuracy and expertise. Well-trained forensic scientists and medical examiners can be the determining factor in the ability of evidence to adequately represent the facts of a case and can provide an analysis of the evidence, witness testimony on examination of results, technical support and even training in his or her specialized area. The mishandling or misinterpretation of evidence can be devastating to the goals of the Criminal Justice System. An expert evidence helps the Courts to draw logical conclusions from the facts presented by experts, based on their opinions. In India, we have adversarial system of Justice Administration and ordinarily medical evidence is admitted only when the expert gives an oral evidence under oath in the courts of law expect under special circumstances. Conversely, correctly applied forensic science ensures that Justice is served and innocent persons remain free. Hence, experts are routinely involved in the administration of Justice particularly in Criminal Courts, interpretation of findings and presentation of the conclusions or results reached for use in Court to access justice; often arises constraints.

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Introduction

Firearm- related crimes and injuries are among the major concerns to public safety. Firearms have passed through continuous evolutionary changes and have been established as the most popular instrument for committing homicide. There are many unique features of firearms that may be of critical importance in a forensic investigation. The result is that Police heavily lean towards oral evidence, instead of concentrating on scientific and circumstantial evidence. The analysis and interpretation of fire arm injuries are among the most challenging assignments for a criminal investigators. Every criminal investigation is a problem in inductive logic, involving the use of the fundamental principles of logical reasoning isolate, deviate, measure. These methods are subconsciously applied in even the simplest deductions from observations, and still more so by the scientific specialist who has been trained to draw conclusions from facts which, in the absence of such training, would probably escape notice or be regarded as of no importance. Even investigating authorities and Judges in establishing the cause of death, sometimes doctors face embarrassing situation in the court hall while deposing evidence. Estimating the firing distance, distinguishing exit wounds from entrance wounds, are some of the questions the expert may be called upon to consider. Usually, the distinction between entrance and exit wounds is made by an examination of their characteristic morphologies.

Firearms evidence is usually encountered in crimes against persons such as homicide, assault and robbery; but may also be found in other crimes such as burglary, rape, and narcotics violations. While comparisons of bullets and cartridge cases to specific firearms are the most common examinations requested, other examinations are possible such as: distance determinations based on powder residue or shot spread; examination of firearms for functioning or modification; sequence of shots fired and trajectories; list of possible weapons used; serial number restoration and ownership tracing. Evidence of firing or handling a firearm may be detected through the analysis of gunshot residue collected from a person's hands or other body surfaces. If criminal justice administration has to improve and society is to be protected from crime, lawyers practicing on the criminal side whether for defence or prosecution have to appreciate the nature of the malady and equip themselves with the knowledge and skills necessary to act as officers of the court in its search for truth.

Position of Forensic Evidence

Forensic science is a scientific advancement in the field of crime investigation and the information gathered and examined will be finally submitted as evidence in the Court of law.

Forensic evidence is also used to link crimes that are thought to be related to one another. It involves several scientific fields in process of retaining evidence, such as medicine, microbiology, pathology, chemistry etc. It is an important subject for crime investigation. It could be described as a combination of science and criminal justice. Forensic Science is application of science or scientific techniques to the law and to solve a crime. Forensic Experts, Forensic Scientists, Crime Investigators and Examiners apply forensic science techniques to solve crime, examine & authenticate; evidences, suspected documents, fingerprints, digital files etc. Often it can help to establish the guilt or innocence of possible suspects. Forensic evidence is also used to link crimes that are thought to be related to one another like sciences used texts of Criminology, Forensic Science, Forensic Expert, Law of Evidence, Relevancy, Medical, Ballistic, DNA, Foot-prints, Courts decisions etc. Forensic Science plays a very significant role in the detection of any crime; it acts as an assistance and instrument to the investigation process. It's a science through which all physical evidences are collected and tested by forensic experts. It has been viewed as a last resort in many of the cases and the reports of forensic experts play a very vital role not only in terms of criminal justice system but also in terms of civil lis and other matters. Physical evidences should be collected from the scene of crime in a proper manner, so that experts should be able to conduct the tests of physical relevant evidences in the laboratories with proper reports. There are many categories of forensic science which includes Forensic Medicines, Ballistics, Fingerprints, Question Documents, Voice Analysis, Narco-analysis etc. Forensic scientists often work as generalists, meaning that they have expertise in working with a wide variety of evidence types. However, many also specialize in the use of certain techniques and tools. Different types of evidence require different skills and equipment. Types of evidence that are most frequently analysed during investigations include: trace evidence, biological and ballistic evidence. Ballistics is the study of firearms and, in particular, the path that a bullet takes during flight. Analysis of forensic evidence is used in the investigation and prosecution of civil and criminal proceedings.

Constraints in Investigation of Fire Arm Injuries

Criminal investigation is an applied science that involves the study of facts, used to identify, locate and prove the guilt of an accused criminal. A complete criminal investigation can include searching, interviews, interrogations, evidence collection and preservation and various methods of investigation. Modern-day criminal investigations commonly employ many modern scientific techniques known collectively as forensic science. For every case that

is being tried in the court of law, scientific evidence is required to prove the innocence of the suspect or to punish him according to the law. To make the task easier, the Criminal Justice System is looking towards giving scientific conclusions to cases and the branch of science which is helping in the application of scientific principles for effective administration of Criminal Justice system is called Forensic Science. Forensic science is a multidisciplinary science which helps in proving cases with scientific evidences. Evidence recovered from a crime scene tells its own tale and leads the investigator to the victim, suspect or people involved in the crime. A bloodstain, a seminal stain in sexual assault, a forged signature in document, a hair sample, skeletal remains recovered from crime scene, a morphed photograph, a fired weapon, a broken glass, a narcotic drug, a visceral sample collected after autopsy, a fingerprint on a tea cup found in the crime scene and many more evidences can help the police reach the suspect.

Forensic Ballistics is the branch of science dealing with the investigation of firearms, ammunition and the problems arising from their use. A firearm is any weapon which discharges a missile by the expansive force of the gases produced by the burning of an explosive substance. Proximal i.e. Internal Ballistics is the study of firearms and projectiles. Intermediate i.e. Exterior Ballistics is the study of the motion of projectile after it leaves the gun barrel till the time it hits the target. Terminal Ballistics involves the study of behaviour of missiles once they penetrate their targets. Wound Ballistics is the study of the effect of missiles on living tissue. During the bullet's attempt at perforating the skin while entering, due to the spin, the edge of the entrance wound may be abraded in the form of a collar, called abrasion collar or areola. In some cases there is contusion instead of abrasion, in which case it is more appropriately called contusion collar. The diameter of the entry hole together with the abrasion collar may give the approximate diameter of the bullet. The barrel of a fire arm is generally lubricated between uses. When such a weapon is fired, the bullet as it is propelled through the barrel would naturally carry this grease used as lubricant on it, which subsequently gets deposited on the skin around the entrance wound. The spin of the bullet causes wiping of its surface on the skin while entering. This is called grease or dirt collar. When both abrasion and grease collars are present, the grease collar is seen as the inner zone while the abrasion collar constitutes the outer zone. Burning/scorching/singeing of the skin and hair result from the flame that emerges from the muzzle, at the time of firing. Clothing around the entry wound may also show evidence of burning.

Tattooing or peppering results from the grains of gunpowder being driven into the skin, each grain acting as a minute missile. Tattooing is seen on the skin as small, discrete, black specks

which cannot be wiped off. The extent of tattooing will depend on the calibre of the weapon, the type of powder used and the range. The same may be absent, if the firing has taken place through clothing. Blackening or smudging results from a superficial deposit of smoke on the skin. In other words, it is only carbon particle deposition over the skin and hence can be easily wiped off with a wet sponge. The intensity of the smudging will depend on the calibre of the weapon, the type of powder used and the range. Thus, the greater the calibre of the weapon, wider the area of blackening and vice versa. Smudging may also be absent on the skin, if firing has taken place through clothing. The presence of blackening, especially if a smokeless powder is used, may not be clearly visible to the naked eye. In such cases infrared or ultra violet photography will help to visualize it. Carbon mono oxide is also evolved on explosion of gun powder and imparts a cherry red colour to the surrounding tissues. A lead ring or metal ring around the entry wound results from deposition of very small quantities of lead or other metal in the form of a ring or collar, as the projectile enters the skin. The lead ring can be appreciated radiologically or by Neutron Activation Analysis.

In contact shot the firearm is placed in contact with the skin or clothing. A contact wound over a dense area, such as the vault of the skull, is generally large and cruciate i.e. cruciform, stellate or star shaped due to explosive effects of the gases liberated. The imprint of the muzzle of the weapon may be found stamped on the skin. Burning, blackening i.e. smudging and tattooing are slight or absent in the adjacent skin, since all the components of the explosion are driven into the wound. The tissues are often saturated with carbon mono oxide and therefore cherry red in colour. Cranial contact wounds are generally seen on the forehead or temple. Contact wounds over thin bone, chest or abdomen are usually circular in shape and are surrounded by abrasion or contusion collar. The overall diameter of the hole plus the collar represents the proximate diameter of the bullet. The surrounding hair is also singed. In close shot the fire arm was fired within the range of flame and powder blast but was not in direct contact with skin or clothing. In near shot it means that the firearm was fired outside the range of flame but within the range of powderblast. The entry wound is circular or oval in shape. In distant shot it means that the fire arm was discharged outside the range of flame and powder blast. The entrywound is circular with inverted margins. Distant shots suggest a range beyond self-infliction. The range in any case of gunshot injury can be estimated accurately by test firing, using the same gun and similar cartridge at different ranges and comparing the effects with wound present in the victim. In the skull, the wound of entrance shows a punched-in hole in the outer table. The inner table is unproven and a cone-shaped piece of bone is detached forming a crater that is larger than the hole on the outer table and shows

bevelled. At the point of exit, a punched-out opening is produced in the inner table and bevelled opening on the outer table. The wound is funnel shaped, with the funnel opening up in the direction in which the bullet is travelling in both entrance and exit wound. The exit wound is larger due to deformity and tumbling of the bullet after entering the skull. They may often be associated with fissured fractures, radiating from the central hole. Exit wounds vary greatly in size, shape and configuration. They are usually larger than the corresponding wound of entry. In the case of low-velocity weapons, the track can be devious instead of straight. An X-ray prior to autopsy assists significantly in locating bullets or pellets lodged in the body.

The bullet is marked for future identification by inscribing the autopsy surgeon's initials on the base with a sharp pointed instrument and not on its sides or nose, as this will obliterate other marks that may already be present. Bullets meant for future examination must be wrapped in absorbent cotton and preserved in empty cardboard boxes. The suspect weapon and the crime bullet are both examined by a ballistics expert and to find out whether the bullet recovered had been fired from the suspect weapon or not, test firing is done. A test shot is fired from the weapon into a box, which is packed with cotton wool. The "test bullet" which is fired is recovered and both the "test bullet" and the bullet recovered from the crime scene are then compared under "comparison microscope". This is the kind of microscope under which two objects can be compared simultaneously. If the rifling marks are identical on the test and crime bullets, then the suspect weapon is considered to be used for the weapon of offence. Examination of a spent cartridge case will also provide valuable clues in identifying the crime weapon. The shot gun cartridge bears the name of the manufacturing firm and sometimes the calibre is imprinted on the casing. The size of the spent case provides a clue regarding the calibre of the weapon. In revolver, the empty case usually remains within the weapon, so that it is rare to find it at the scene of crime. If an empty case is seen at the scene of crime, generally in pistol or rifle, it is found few feet to the right of the spot where the weapon was discharged. The firing pin will make a dent on the base, which is peculiar to that weapon.

Medical Expert

A forensic scientist is expert in any technical field and can provide an analysis of the evidence, witness testimony on examination results, technical support and even training in his or her specialized area. In most of the laboratories in India the firearm and tool mark division is a part of Physical section but in some others it varies according to convenience and number

cases referred to the lab. Tools in the form of comparison microscope and others required for firearm identification, comparison of markings on bullets and other projectiles, cartridge cases & shell cases, especially for the purpose of determining if a bullet has been fired from a particular weapon. Tool mark examinations are concerned with the association of particular impressions with particular tools. Seeing the incidence of deaths caused by firearms, forensic pathologists also must possess a thorough understanding of the patterns of injuries caused by these weapons. New technology can be used and refined not only to keep forensic scientist on the cutting edge of science, but to maintain the highest standards of quality and accuracy. An accurate evaluation of the pattern of atypical lesions found in the post-mortem examination is necessary in order to evaluate the cause and the manner of death. The ability to determine the nature of the firearm is of great significance in the criminal investigation. The modern detective officer is well aware of the importance of cause of death, and the value of scientific examination of such stains is being increasingly recognized in the courts. Forensic scientists also work on developing new techniques and procedures for the collection and analysis of evidence. In this manner, new technology can be used and refined not only to keep forensic scientist on the cutting edge of science, but to maintain the highest standards of quality and accuracy. The in depth analysis of forensic evidence brings us to the main course of any topic. In India, we have adversarial system of justice administration and ordinarily medical evidence is admitted only when the expert gives an oral evidence under oath in the courts of law expect under special circumstances. Therefore, it was planned to undertake a pilot study to analyse the quantum of time and effort put in by medical experts to get the evidence recorded in criminal courts and other issues related to it.

Evidentiary Value of Expert Witness

During an investigation, forensic evidence is collected at a crime scene, analyzed in a laboratory and often presented in court. Each crime scene is unique, and each case presents its own challenges. Complex cases may require the collection, examination and analysis of a large amount of evidence. Forensic science is the use of science in the service of the law. Sciences used in forensics include any discipline that can aid in the collection, preservation and analysis of evidence such as Chemistry (for the identification of explosives); Engineering (for examination of structural design) and Biology (for DNA identification or matching). Analysis of forensic evidence is used in the investigation and prosecution of civil and criminal proceedings. Often, it can help to establish the guilt or innocence of possible

suspects. Forensic evidence is also used to link crimes that are thought to be related to one another.

Sections 45 to Section 51 under Chapter-II of the Indian Evidence Act, 1872 provide relevancy of opinion of third persons, which is commonly called in our day to day practice as expert's opinion. These provisions are exceptional in nature to the general rule that evidence is to be given of the facts only which are within the knowledge of a witness. The exception is based on the principle that the court can't form opinion on the matters, which are technically complicated and professionally sophisticated, without assistance of the persons who have acquired special knowledge and skill on those matters. Expert opinion becomes admissible only when the expert is examined as a witness in the court. The report of an expert is not admissible unless the expert gives reasons for forming the opinion and his evidence is tested by cross-examination by the adverse party. The value of expert opinion rest on the facts on which it is based and his competency for forming a reliable opinion. The evidentiary value of the opinion of expert depends on the facts upon which it is based and also the validity of the process by which the conclusion is reached. Where the experts give no real data in support of their opinion, the evidence even though admissible, may be excluded from consideration as affording no assistance in arriving at the correct value. The Allahabad Court pertaining to the issue in question stated that the value of expert evidence depends largely on the cogency of the reasons on which it is based. In general it cannot be the base of conviction unless it is corroborated by other evidence. Evidence of experts after all is opinion evidence. The opinion is to be supported by reasons. The Court has to evaluate the same like any other evidence. The reasons in support of the opinion, if convincing, make the opinion acceptable. Experts are admissible as witness but, they are not to make conclusion as it is a judicial function. The whole profile of Indian Penal Code is based on medical analysis, reports, technical assistance and scientific knowledge, which facilitate the task of courts to search and investigate the crime. The mere opinion of an expert cannot balance the positive evidence of the attesting witness. Expert opinion is not necessarily binding on the Court. Medical records are acceptable as per Section 3 of the Indian Evidence Act, 1872. A Court is not bound by the evidence of the experts which is to a large extent advisory in nature. The Court must derive its own conclusion upon considering the opinion of the experts which may be adduced by both sides, cautiously, and upon taking into consideration the authorities on the point on which he deposes. Hence, from the different judicial pronouncements it can be inferred that expert evidence or opinion is not a cogent or conclusive evidence and to make it a stronger evidence in a case it has to be supported by reasons and relevant data. But the expert's

opinion is a weak form of evidence, especially in the cases where the sufficiency of knowledge is doubtful.

Conclusion

With the progress of science and development of technology the notion of crime as well as the methods used by criminals in commission of crime has undergone a phenomenal transformation. The very nature of crime itself has undergone complete transformation. Forensic science plays an integral role in the criminal justice system. Well-trained forensic scientists and medical examiners can be the determining factor in the ability of evidence to adequately represent the facts of a case. Quality forensic science can play in a complicated case. In complicated cases, and even in relatively simple ones, the most minute of details can become paramount to a successful prosecution or defense. Forensic scientists are trained to analyse fire arm injuries, crime scenes, evidence, and personal testimony to create a visualization of how a crime occurred. An understanding of the circumstances surrounding a crime is pivotal to ensuring that the correct charges are brought against the correct person. The mishandling or misinterpretation of evidence can be devastating to the goals of the criminal justice system and can result in the wrongful conviction of innocent persons and the failure to convict the true perpetrator, which is why we need a skilled criminal defense lawyer if we've been convicted of a criminal offense. Conversely, correctly applied forensic science ensures that justice is served and innocent persons remain free.

In the vast majority of cases, forensic science has been responsible for ensuring the detection of an offender and securing a just result or outcome in a case. But not always. Forensic science has shaped the world of justice, fuelling crime investigations and signifying the progress of modern technology. In, India, it is a common perception that lot of time and effort is required to record evidence and therefore by enlarge members of the medical profession does not like to involve in medico legal cases. The different types of methods that can be used in forensic science and their acceptability in the legal system. There is a unanimity that medical and forensic evidence plays a crucial role in helping the courts of law to arrive at logical conclusions. Therefore, the expert medical professionals should be encouraged to undertake medico legal work and simultaneously the atmosphere in courts should be congenial to the medical witness. This attains utmost importance looking at the outcome of the case, since if good experts avoid court attendance, less objective professional will fill the gap, ultimately affecting the justice. The need to involve more and more professionals in expert testimony has been felt by different organizations. In India, it is a common perception

that lot of time and effort is required to record evidence and therefore by enlarge members of the medical profession does not like to involve in medico legal cases. Forensic science paves the way for justice, with the help of technology advances. Every cutting-edge technology used by forensic researcher will be an effort by forensic science to prove a crime without any constraints. In these circumstances, what can the police investigator turn to, except the developing Forensic Science? In this framework, existence of forensic science originated. With the advancement of science and technology, the criminals have adopted new methods and techniques for committing offences. At the same time, advances in Forensic Sciences have made detection of crime scientifically feasible. But admissibility of medical science is questioned now and then. But to know its evidentiary value in the criminal administration we need to know the meaning of scientific evidence and its historical background and for better understanding to forensic expert take in to per view a commonly applied method of forensic evidence is essential.