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Photography for forensic odontologists & its impact on the judicial process

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ABSTRACT-

Forensic odontologists can play a crucial role in the judicial process of a criminal case. They collect valuable evidence during the investigation process and document the whole process. Documentation can be done in different ways and photography is one of the good methods to collect some pieces of evidence and document other valuable evidence. The outcomes of the criminal cases all depend upon the scientific and other shreds of evidence. Photography is now a very good way to document the crime scene and the various pieces of evidence present at the crime scene. Photographs are easy to show to the jury and magistrates and one photograph can easily explain the crime scene which is sometimes difficult to explain in many words. Forensic odontologists being part of the team, especially in mass disasters can utilize the knowledge and skills of photography and can be helpful to the investigation team. Digital cameras have revolutionized the use of forensic photography. Videography further adds value to photography. Drone photography and CCTV Photography can be of further help to the forensic odontologist in certain circumstances. Using alternate sources of light can further add value to photography. Intraoral cameras and selfies can also help in diverse medico legal situations. It is important to understand the importance of the background in photography and not to add the artefacts during photography. It is also important to know which format of the saved digital photography will be acceptable in the courts and know the limitations and advantages of photographic documentation.

Keywords: Forensic photography; odontologists, investigation, crime scene, bitemarks.

Introduction

Forensic photography is photography which helps in the delivery of justice by documenting photographically the details of the evidence utilizing the technical knowledge and skills of photography.

Photography is commonly used at the crime scene investigation to capture the evidence and photographic evidence has been accepted in the courts. With the onset of digital photography, it has become very convenient to record and store photographic evidence and show it to investigators and judges. The only issue is to know the legal requirements of forensic photography so that forensic photography is accepted in the courts.

To practice forensic photography basic equipment of photography is required e.g., a Digital Single Lens Reflex (DSLR) Camera, tripod stand, forensic rulers (ABFO 2 scale, coloured checker charts), compass, spirit level, flash guns with batteries, cross polarising filters and additional wide-angle lenses, telephoto lenses, fish-eyed lenses, macro lenses and extension tubes.

Flashes should be used where necessary as it helps to illuminate the area of photography, increases the depth of the field and helps to record the details of the crime scene.

The use of forensic Photography has been well-established in forensic odontology.[1]

When the dental charts are prepared during a postmortem examination for identification photographing the dentition definitely will be more acceptable in the courts.[2]

Proper training in forensic photography is a must before this can be applied in a good way to forensic odontology. [3]

Computerized photography will greatly help in these areas especially when the SOPs are followed. Whenever medicolegal photographs are stored these should be stored

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in password-protected folders [3]

Digital photography[4] and Full spectrum digital photography is the best method to collect and preserve evidence in cases of bite marks in forensic odontology.[5] when the bitemarks have healed then in those cases UV and IR photography can be of great help.[4]

Intraoral 3-dimensional scanners increase the accuracy of impressions in case of bite mark analysis and to increase its efficacy LASER and optical scanners are better.[4] Dental Print software will greatly help in the comparison of 3D prints with photographs or impressions of the bite marks.

Teeth fluorescence at different age groups can also help in age determination which can be recorded by photography.[5]

Photography can be very useful in the identification of the photographs of the teeth. Visible light photography as well as UV photography can help in this.[5]

Sometimes teeth are extracted so that identification may become difficult. In these situations, UV photography can be helpful when the tool marks can be detected on the teeth and alveolus.[5]

Selfies can also be used in identification and it can be of great help in the identification. In one of the surveys, 73.2% of participants' forensic odontologists considered that selfies can be useful for identification. Selfies can be supplementary antemortem dental evidence [6]

As digital forensics has created a revolution similarly digital photography is a revolution over the previous film-based photography.[4]

UV photography can help in the detection of composite resin material in the teeth and help in the identification.[7] It can also be possibly used in the future for age estimation.[7]

Material & Methods

Google Scholar is used to search the articles using keywords. Out of these articles relevant articles were studied further to incorporate the precise knowledge into this paper.

Discussion

Forensic photography is photographic evidence which can be utilized by investigators and prosecutors to build their case in front of the judges and by defence witnesses to establish their viewpoints.

Forensic photography is a very good way of recording the evidence at the crime scene and this holds for forensic odontologists too. The only issue is that forensic odontologists should know the basics of photography and the legal requirements of forensic photography so that there are no questions raised about the authenticity of the photograph being used by forensic odontologists.

In dentistry, an intraoral camera is quite useful for recording the details of teeth which can be useful in identification. Intraoral scanners can be very useful for recording minute details and making casts of the accused from which transparencies can be made to exclude the innocents from the list of accused in case of bite marks.

Different lighting techniques can be used under different circumstances to have good photographs. Oblique lighting especially is very useful in certain situations while brightfield and darkfield illumination may be useful in other circumstances. Transillumination or backfield illumination and coaxial illumination may be useful in other circumstances. Choosing the right lighting techniques will help to get a good photograph.

Alternate light sources can be useful in certain situations. Cross-polarized lights and alternate fluorescent light sources make a difference in certain circumstances. Fuzi UV and IR cameras are useful for recording in UV and IR light sources and can be useful to record old bite marks when these may not be visible to the naked eye.

Videography, CCTV photography, selfie photography and SLR Cameras have their utilities and constraints as far as their utility in forensic odontology. Similarly panoramic and 3600 photography have their utilities.

DSLR cameras can record injuries in and around the mouth. While recording the injuries it should be taken care that the injuries are properly lit, and their orientation to other facial parts is preserved; these should never be bigger than life-size and forensic rulers should be in the field and there should be no shadows. The right aperture and right speed should be used.

Flash should be used to avoid shadows even during sunlight. During rain a lens hood or umbrella may be used. In fog, flash should be used at an angle of less than 450. If there is excessive wind speed the shutter speed should be increased. A sturdy tripod stand will also be of great help in such circumstances.

3D photography can help to reconstruct the crime scene beautifully which can be very useful to the investigators as well as the judiciary but this has the limitation that it requires costly equipment and expertise.

In videography along with the recording of the crime scene investigator can record the narration which can be very useful later on. Videography cannot be a replacement for still photography and both can be complementary to each other.

CCTV recording is very useful for the identification of the accused persons and now CCTV is also coming with facial recognition features which will further help in the identification.

Selfies can help in identification in mass disasters as the front teeth are usually visible which can help in identification. Even now apps are available which can help in the identification of selfies.

Peripheral cameras are good for photography on curved surfaces and bitemarks on the curved surfaces can be recorded in a good manner by peripheral cameras.

While photography is being done crime scenes should not be disturbed and contaminated. The date and time of photography along with compass direction should be documented along with weather and lighting conditions. Make and Focal length of the camera should also be documented along with the name of the photographer.

The background should be plain and non-reflective and photography should not be done against the source of light. Consent for the photography should be taken and it will be better if the same gender photographer is there. In the case of violent subjects, the presence of the investigator will be useful to avoid physical attacks on the photographers.

Photographers should protect themselves from infections and if needed personal protective Equipment should be used. If he has contaminated the scene accidentally should inform the investigator and give his fingerprints and shoe prints to the investigator.

The RAW format must be preserved for the courts as this is acceptable in the courts. If stored in computers folders must be password protected and passwords should be strong.

Forensic photography is good for recording the crime scene and injuries. It is also good for recording the dying declaration and recording the statements of witnesses and suspects. Forensic odontology is good for the recording of bitemarks, recording of facial and dental injuries, and recording of the condition of teeth in mass disasters along with charting of postmortem dentition.

Conclusion

Forensic odontologists can use photography at various crime scenes for recording the evidence. This can be of particular help in bite mark cases both fresh and old cases. It can be used in mass disasters to record postmortem dental evidence along with charting. Selfies too can help in identification. It can be of help to record and find out the tool marks when teeth are removed to obscure the identification. It can help in age estimation by studying the teeth' fluorescence. All this will be possible if forensic odontologists know the basics of photography to capture good photographs and the legal requirements associated with using forensic photography. Well-presented photographic evidence will have an impact on the outcome of the judicial processes. Forensic photography is good as it is easily understood by the common man, investigators, prosecutors, defenders, and judges.

Conflict of Interest: None

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