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Iatrogenic cutaneous artefacts encountered during autopsy

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Abstract

Introduction and Objective: In this 21st century autopsy surgeon often encounters various types of treatment related injuries during autopsies. They must be able to distinguish between injuries caused by therapeutic procedures and those caused by other factors, such as assaults and accidents. This prospective study was conducted at M.S. Ramaiah Medical College, Bangalore, from October 2008 to March 2010 with aims and objectives to study the pattern of Iatrogenic cutaneous artefacts encountered during autopsy and to ascertain the relationship of Iatrogenic cutaneous artefacts to sex of the deceased if any.

Materials and Method: Data was collected by detailed questionnaire, focusing on the history furnished by the police in requisition form and inquest report, by the relatives and hospital records.

Result: Iatrogenic cutaneous artefact was present in 58.13% cases. Out of these 34.38% were males and 23.75% were females. Most common cutaneous artefact was intravenous injection line mark mimicking like contusion. It was present in 45.00% cases. Defibrillator burn artefact was present in 12.80% cases. Chest abrasion/contusion was present in 13.13% cases. Iatrogenic cutaneous artefacts were found to be independent and there is no relation between these artefacts and sex of the deceased.

Discussion: In a prospective study by JP Krischer, EG Fine, JH Davis and EL Nagel defibrillator burn artefact was found in 30.70 % cases and chest abrasion/contusion was present in 59.30% cases. This may be because of increase awareness regarding proper use of Defibrillator.

Conclusion: Whenever in doubt about nature of infliction of injury autopsy surgeon should refer hospital case sheet particularly emergency room records and may have talk with treating doctor whenever possible before labelling such injury as evidence of underlying assault, accident or an artefact.

Keywords: Artefact, Iatrogenic, Autopsy

Introduction

Artefact is defined as any change caused or feature introduced in the natural state of the body that is likely to be misinterpreted at autopsy.(1) Iatrogenic Injury is defined as unintended or unnecessary harm or suffering arising from any aspect of healthcare management.(2) Artefacts arising from these injuries are called as Iatrogenic artefacts.

In this 21st century, due to advancement in medical care most of the bodies examined at autopsy have some attempt of cardiopulmonary resuscitation (CPR) before pronouncement of death. An unending variety of therapeutic procedures are performed on patient for the treatment of illness or injury. Sometimes it is inevitable that even with the best of care, unintended consequences may occur during these procedures. Even therapeutically unimportant injuries can be important for forensic pathologists since they have to distinguish Iatrogenic injuries from those caused by accident or assault.

Since autopsy surgeon often encounter various types of treatment related injuries during autopsies, they must be able to distinguish between injuries caused by therapeutic procedures and those caused by other factors, such as assaults and accidents. The recognition of injury or other mark as artefact from therapy can be more challenging if the therapeutic material is removed from the body before the autopsy surgeon has had an opportunity to view the body.(3) Lip contusions, lacerations and tooth fracture from attempted intubation, facial contusions from air-bag valve mask use and extensive subcutaneous hematoma from attempted jugular or subclavian catheter placement may be more difficult to interpret, especially if the resuscitation history is unknown or not sought.(4) Emergency care providers who are knowledgeable about CPR-related injuries may be able to recognize and limit iatrogenic injuries during the critical moments of resuscitation. This information is also crucial to enable medical and legal professionals to assess the significance of injuries in children suspected of being abused.(5)

This study was conducted with objectives to study the pattern of Iatrogenic cutaneous artefacts and to ascertain whether there is any relationship between Iatrogenic cutaneous artefacts and sex of the deceased.

Materials and Method

The present observational prospective study was conducted in the department of Forensic Medicine M.S Ramaiah Medical College, Bangalore from October 2008 to March 2010, for a period of 18 months. Ethical clearance was obtained priory. Cases subjected for autopsy having history of therapeutic/surgical measure instituted in hospital were included in the study. Data was collected by detailed questionnaire, focusing on the history furnished by the police in inquest and requisition form, by the relatives and hospital records.

Cases in which even after taking proper history and referring case sheet it was not clear about cause of cutaneous injury whether evidence of underlying assault, accident or due to hospital treatment were excluded from the study population.

Post mortem examination of the case was carried out as per the standard procedure mentioned in the "Autopsy diagnosis and technique" by Otto Saphire.[6] Blood and viscera were sent for chemical analysis in suspected cases of poisoning. Descriptive statistics for various Iatrogenic cutaneous artefacts encountered is given.

Result

During the study period 160 autopsy cases were having history of some form of therapeutic/surgical measure instituted in hospital. Out of these 128(80%) were males and 32(20%) were females. Iatrogenic cutaneous artefact was present in 93(58.13%) cases. Out of these 55(34.38%) were males and 38(23.75%) were females. Most common cutaneous artefact was intravenous injection line mark mimicking like contusion. It was present in 72(45.00%) cases.

Defibrillator burn mark was present in 8 (12.80%) cases. Out of these in 5 cases there were two marks over front of chest i.e. one over right side of sternal angle just below right clavicle and another over left side of chest, extending from third to sixth rib at midaxillary line, whereas in 3 cases there was only one mark i.e. over left side of chest. Shape of defibrillator burn mark depends on the shape of pad of the defibrillator machine; in older machines it was circular whereas in newer one it is rectangular in shape. In this study in 6 cases mark was rectangular whereas in 2 cases it was circular.

Photograph showing extravasation of blood due to multiple intravenous line insertion mark mimicking like contusion

Photograph showing ring like burn mark caused by the Defibrillator paddle- an artefact which may be confused as abrasion/ contusions

Photograph showing circular marks over front of chest caused by ECG machine chest leads mimicking like contusion

Table 1 shows that Iatrogenic cutaneous artefacts are independent and there is no relation between these artefacts and sex of the deceased.

Table 1: Iatrogenic cutaneous artefacts in detail

Sr. No	Artefact	No. of cases having particular Artefact (figures in bracket indicate percentage)	Male	Female
1	Defibrillator burn mark	08 (12.80)	6	2
2	IV line mark	72 (45.00)	43	29
3	CVP line mark	40 (25.00)	18	22
4	Intercostal drainage	25(15.63)	23	02
5	Abdominal drainage	05 (03.13)	5	0
6	Fasciotomy wound	02 (01.25)	1	1
7	Tracheostomy wound	10 (06.25)	8	2
8	Intracardiac injection mark	00 (00.00)	0	0
9	Peritoneal lavage wound at umbilicus	02 (01.25)	2	0
10	Venesection	03 (01.88)	1	2
11	ECG Monitor chest lead mark	20 (12.50)	8	12
12	ECG machine chest lead mark	01 (00.63)	0	1
13	Arterial puncture mark of hemodialysis	02 (01.25)	2	0
14	Arterial puncture mark of ABG sampling	02 (01.25)	0	2

Discussion

In a prospective study of the complications of cardiac resuscitation by JP Krischer, EG Fine, JH Davis and EL Nagel Defibrillator burn artefact was found in 30.70% cases and chest abrasion/contusion was present in 59.30% cases.[7] In this study defibrillator burn artefact was present in 12.80% cases, this may be because of increase awareness regarding proper use of Defibrillator particularly use of proper energy (joules) and use of electro conductive jelly before applying defibrillator pads.

Chest abrasion/contusion was present in 21 out of 160 cases i.e. 13.13% cases (ECG monitor chest lead mark mimicking like abrasion and ECG machine chest lead mark mimicking like contusion). In this study there was no intracardiac injection artefact. It may be because now it is not preferred since it is prone to serious complications such as intramyocardial injection, coronary laceration and pneumothorax. Instead of this intravenous injection followed by 20 ml bolus of intravenous fluid and elevation of extremity is recommended. If an i.v. line has not been established, the endotracheal route may be used.[8]

Conclusion

In this study Iatrogenic cutaneous artefacts were present in 58.13% cases at autopsy. This indicate that these artefacts are present in significant number of cases which can lead to misinterpretation of findings as evidence of underlying assault or accident if autopsy surgeon is not aware about these artefacts.

In our country majority of autopsies are done by medical officers working in rural areas. Hence MBBS student's needs to be sensitised about these artefacts in undergraduate teaching. Whenever in doubt about nature of infliction of injury in such cases autopsy surgeon should refer hospital case sheet particularly emergency room records and may have talk with treating doctor whenever possible before labelling such injury as evidence of underlying assault, accident or an artefact.

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References

1. Vij Krishan. Textbook of Forensic Medicine and Toxicology. 5th ed. New Delhi: Elsevier; 2011. 31pp.
2. Iatrogenic injury in Australia. Australia: Australian Patient Safety Foundation; 2001 August.
3. Dolinak David, Matshes Evan W., Lew Emma O. Forensic pathology principles and practice. Oxford: Elsevier; 2005. 317pp.
4. Plunkett John. Resuscitation injuries complicating the interpretation of premortem trauma and natural disease in children. J Forensic Sci 2006 Jan; 51(1):127-130.
5. Bush Colleen M, Jones Jeffrey S, Cohle Stephen D, Johnson Harrison. Paediatric injuries from cardiopulmonary resuscitation. Annals of emergency medicine 1996 July 1; 28:40-44.
6. Otto Saphire. Autopsy diagnosis and technic. 4th ed. Illinois: Hoeber Harper; 1965. 17-30 pp.
7. Krischer JP, Fine EG, Davis JH and Nagel EL. Complications of cardiac resuscitation. Chest 1987; 92:287-291.
8. Irwin Richard S., Rippe James M. Irwin and Rippe's intensive care medicine. 6th ed. Philadelphia: Williams and Wilkins; 2008. 197 pp.