Case Report

ARTEFACT OR CAUSE OF DEATH: CRITICAL ANALYSIS OF AUTOPSY FINDINGS TO RESOLVE THE DILEMMAS – A CASE REPORT.
Dr. HS Tatiya, Dr. SB Punpale, Dr. AA Taware, Dr. VT Jadhav, Dr. AL Bandgar

Authors
Dr. H. S. Tatiya, JR- II, Department of Forensic Medicine and Toxicology, B.J. Govt. Medical College and S.G. Hospitals Pune.

Dr. S. B. Punpale, Professor and Head, Department of Forensic Medicine and Toxicology, B.J. Govt. Medical College and S.G. Hospitals Pune.

Dr. A. A. Taware, Associate Professor, Department of Forensic Medicine and Toxicology, B.J. Govt. Medical College and S.G. Hospitals Pune.

Dr. V. T. Jadhav, Assistant Professor, Department of Forensic Medicine and Toxicology, B.J. Govt. Medical College and S.G. Hospitals Pune.

Dr. A. L. Bandgar, JR- I, Department of Forensic Medicine and Toxicology, B.J. Govt. Medical College and S.G. Hospitals Pune.

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Corresponding Author: Dr. H. S. Tatiya
Department of Forensic Medicine and Toxicology, B.J. Govt. Medical College and S.G. Hospitals Pune, 411 001. 9422789579, hstatiyakhalane7@gmail.com
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ARTEFACT OR CAUSE OF DEATH: CRITICAL ANALYSIS OF AUTOPSY FINDINGS TO RESOLVE THE DILEMMAS – A CASE REPORT.
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Abstract
Regurgitation and aspiration of Gastric contents in the respiratory tract is a common agonal artefact seen in forensic practice. This situation is commonly found at postmortem, if victim is unconscious or under the influence of alcohol, drug or anesthesia or during a fit of epilepsy and in dead bodies that have started decomposing. Quite infrequently it may be found in fresh bodies that have undergone sudden unexpected and unattended death leading to a dilemma as to the real cause of death in absence of any other substantial evidence. The real challenge for the autopsy surgeon is to differentiate between ante-mortem aspiration and postmortem spill of gastric contents into the respiratory tract, a well-known artefact in such unattended deaths. Misinterpretation of such artefacts can lead to wrong diagnosis of cause of death. In present case, the death was sudden and unattended and gastric contents in the respiratory tract led to a dilemma as to the real cause of death. Dilemmas of the case with difficulties in diagnosis and critical analysis of autopsy findings to resolve the dilemmas are being presented herewith.

Key Words: Ante-mortem aspiration, post mortem spill, critical analysis, dilemmas.

Introduction
Sudden death can be both natural and unnatural. In sudden natural deaths, the immediate cause of death is usually found in the cardiovascular system [45-50%] followed by the respiratory system [10-15%] [1]. In the respiratory system, choking from mechanical obstruction is one of the causes for sudden and unexplained deaths. This mechanical obstruction is common due to foreign bodies, food bolus, hemorrhages or acute obstructive lesions. Regurgitated stomach contents resulting into choking is a not a common entity and literature available on death from such choking is also not forthcoming [2]. On the other hand regurgitation and aspiration of gastric contents is a common agonal artefact [3]. In cases of sudden death, finding of gastric contents in air passages is by no means as significant as the presence of freshly swallowed food. Gastric contents are commonly found in the larynx, trachea and bronchi at autopsy when no other evidence of aspiration exists and when there is a clear and unconnected cause of death. Gastric contents may reach the air passages from spontaneous agonal regurgitation or during pumping of chest and abdomen during resuscitation attempts. This makes the finding of gastric contents in the respiratory tract less significant [4]. The finding of small amounts of food material in the airway at autopsy does not indicate that the individual choked to death. One can attribute a death to aspiration only if the air passage below the level of larynx is completely occluded by food. It is rarely seen in medico-legal autopsies and is most common in patients who have impaired functioning of central nervous system [5]. A large proportion of deaths from choking occur before any possible hypoxic manifestations have time to take effect. These fatalities might be attributed to cardiac arrest, either purely neurogenic or accelerated by excess catecholamine release from the adrenaline response. Aspiration of vomit, as a cause of death, must be used with great caution unless there is an antemortem medical witness to it. The major exception, however, is acute alcohol intoxication, where if copious inhalation of stomach contents right down to the secondary bronchi is confirmed, then in the absence of significant natural
disease, injury or other toxicity, choking associated with a high blood alcohol level may reasonably be incriminated as the cause. However, it is not an autopsy diagnosis to be made lightly \(^4\).

**Case Report**

A dead body of a 56-year-old male, farmer by occupation was brought for postmortem examination to the Forensic Medicine Department, B.J. Government Medical College and S. G. Hospitals, Pune. The deceased was brought dead to the casualty of the hospital. History revealed that the deceased had an afternoon meal at around 2.00 pm and went on work at his farm for plucking of grass weeds, where at around 3.30 pm he was found in unconscious state by the trace passers and was rushed to the hospital at around 4:30 pm; where the duty doctor declared him as brought dead. On inquiring about the deceased there was no past history of any major illness. There was no history of previous episodes of unconsciousness or being on any medication. He had taken medicines long back for a repetitive complaint of epigastric pain with on and off bouts of regurgitation and retrosternal chest pain after meals.

Postmortem examination was conducted on the same day. External examination was essentially negative with no significant finding. Rigor mortis was well marked in neck and upper limbs of body and lividity was present at back and buttocks, purple red colored and was fixed. Internal examination showed congested viscera. Heart did not show any sign of recent ischemia and coronaries were grossly patent. The yellowish green semi digested semisolid food material embedded in mucous secretions was present in the larynx and trachea up to tracheal bifurcation. Also there was evidence of yellowish green fluid lining the mucosa of whole respiratory tract. Similar food material and fluid was present in the stomach (Ref to photographs 1 and 2 below).

Photo 1: The yellowish green semi digested semisolid food material embedded in mucous secretions at tracheal bifurcation with evidence of yellowish green fluid lining the mucosa.

Viscera were sent for chemical analysis to rule out poisoning and alcohol intoxication and also tissues from the organs were preserved for histopathology. Opinion regarding the cause of death was reserved till the pending reports of chemical analysis and histopathological examination.

The Chemical laboratory investigations were negative for alcohol and poison. Histopathology of heart was unremarkable. There was no evidence of recent or old myocardial infarction. However histopathology of lung pieces showed presence of vegetable matter in the terminal bronchioles as well as in some alveoli. There was also evidence of minimal leucocyte clustering around the foci of vegetable matter in the bronchioles as well as
the alveoli. At many places, the alveoli were expanded with broken septa. After going through the case details available few dilemmas occurred in our minds as:

1. Whether the food material found in the respiratory tract was ante mortem phenomenon or postmortem spill?
2. Whether such autopsies should be labeled as negative autopsies or a questionable cause of death i.e. choking can be given as the cause of death?
3. If choking is the cause of death, what is the mechanism of death?
4. What is the reason of aspiration of gastric contents in the respiratory tract?

A good amount of literature was searched and after analyzing the significant microscopic findings associated with the autopsy findings and history of the case in backdrop of literature the opinion as to the cause of death was finalized as “Choking from aspiration of gastric contents”.

Discussion

In forensic pathology, an artefact is any change caused or a feature introduced into body after death that is likely to lead to misinterpretation of medicolegally significant antemortem findings. It is the duty of the autopsy pathologist to interpret artefacts correctly. The misinterpretation can lead to wrong cause and manner of death [6]. After going through the literature available we deduced the answers to our queries as follows:

1. Whether the food material found in the respiratory tract was ante mortem phenomenon or postmortem spill?

Regurgitation and aspiration of gastric contents is a common agonal artefact. It may be seen in natural deaths, as a terminal event, or due to handling of body or due to resuscitation [3]. Gastric contents in respiratory tract are commonly found at postmortem in acute alcoholism, occasionally during epileptic fit, and in dead bodies that have started decomposing [2]. According to Saukko and Knight, there is no reliable method of distinguishing agonal or even early postmortem over-spill from true vital aspiration unless clinical or other witnessed evidence is available [4]. On the other hand, according to Modi, vomited matter may regurgitate into the larynx and by inspiratory efforts may be aspirated into the smaller bronchioles so as to result in suffocation. If there is postmortem spill, these contents cannot reach the smaller bronchi and bronchioles [7]. In the present case, no positive autopsy finding was observed except for the presence of yellowish green semi digested semisolid food material embedded in mucous, present in the larynx and trachea up to tracheal bifurcation with evidence of yellowish green fluid lining the mucosa of whole respiratory tract, similar to that present in the stomach. This was an unusual finding considering the fact that the deceased was not suffering from epilepsy, chemical analysis did not reveal alcohol, there was no any resuscitation and decomposition had not set in [postmortem was done within 6-8 hours of death], so it cannot be easily overlooked as a postmortem artefact. In the present case, grossly both the lungs were congested and firm. Histopathology report had a significant positive finding of presence of vegetable matter in the terminal bronchioles and alveoli, in sections studied from both lungs. These foci were surrounded by minimal leucocytes. As mentioned in Knight’s forensic pathology, according to Gardner, even histological evidence of leucocyte clustering around foci of gastric contents deep in bronchi is an early postmortem event and not a vital reaction [4]. But in present case considering the fact that the food material was embedded in mucous secretions along with expanded alveoli and broken septa, which is possible because of forced expiratory efforts and coughing as a result of obstruction in the respiratory passages, the leucocyte clustering around the vegetable foci can be considered as vital reaction of antemortem nature and the poor
inflammatory response, in an ante mortem aspiration, can be explained by occurrence of sudden death from choking leaving no time for inflammation to develop. **So the food material found in the respiratory tract was ante mortem phenomenon.**

2. **Whether such autopsies should be labeled as negative autopsies or a questionable cause of death i.e. whether choking can be given as the cause of death?**

As the vegetable matter embedded in mucus being present in the terminal bronchioles and alveoli along with the minimal leucocyte cells surrounding it substantiated the aspiration to be ante mortem and recent in the present case and as there was no any other positive finding on autopsy and viscera analysis, the cause of death can be attributed to choking.

3. **If choking is the cause of death, what is the mechanism of death?**

Asphyxia is the most common mechanism to cause death in choking, but there are cases where the immediate result of choking is vagal inhibition and sudden death. The diagnosis is difficult due to absence of overt signs [6]. Several cases have been reported by Polson et al, wherein witnessed cases of sudden death showed a quantity of vegetable material, part of the lunch, obstructing the air passages downwards from the larynx to the intrapulmonary bronchi of both the lungs at postmortem examination. In all such cases, true signs of asphyxixia were absent and death had been attributed to vagal inhibition [8]. In the present case there were no signs specific for asphyxia and hence the mechanism of death due to choking can be attributed to vagal inhibition.

4. **What is the reason of aspiration of gastric contents in the respiratory tract?**

Choking can occur when vomited material is inhaled by a victim in a state of unconsciousness or under the influence of drink, drug, and anesthesia or during the fit of epilepsy [9]. In the present case the deceased was not on medication, neither he was under the influence of alcohol, drug or anesthesia. Hence none of these factors can be attributed to present case. The patient was only suffering from gastro esophageal regurgitation as per history. A large, fatty meal, lying down, bending over or bending and lifting predisposes reflux [10]. In the present case deceased might have vomited and subsequently aspirated the vomit. The exact triggering factor for gastric regurgitation and subsequent aspiration could not be ascertained and can only be hypothesized as there was no eyewitness to the terminal event. The deceased had gone to work place immediately after his lunch. The kind of work he was doing was plucking of grass weeds from the farming area, in which squatting, bending and lifting is involved. Probably from application of pressure onto his epigastric region due to bending and lifting immediately after his meals, led to regurgitation and subsequent aspiration of the stomach contents into his respiratory tract. The sudden entry of foreign material could have resulted into neurogenic cardiac arrest leading to his death.

**Conclusion**

An autopsy surgeon must be well-versed with phenomenon of artefacts to give conclusive opinion regarding cause of death. A dilemma regarding- gastric contents in respiratory tract whether artefact or cause of death can be solved by analyzing the autopsy findings, history, histopathological examination reports and chemical analysis findings, along with good amount of literature review.

**References**