



# Case #38

NAME Educational Activities Committee

Case provided by:

Dr. Fabiola Righi (PGY3)

Dr. Belinda Galeano (PGY2)

Mayo Clinic, Rochester.



1. The decedent is a 64-year-old man with medical history of chronic obstructive pulmonary disease (COPD) who was found unresponsive inside his secured residence.

What is the most likely reason for the decedent's appearance?

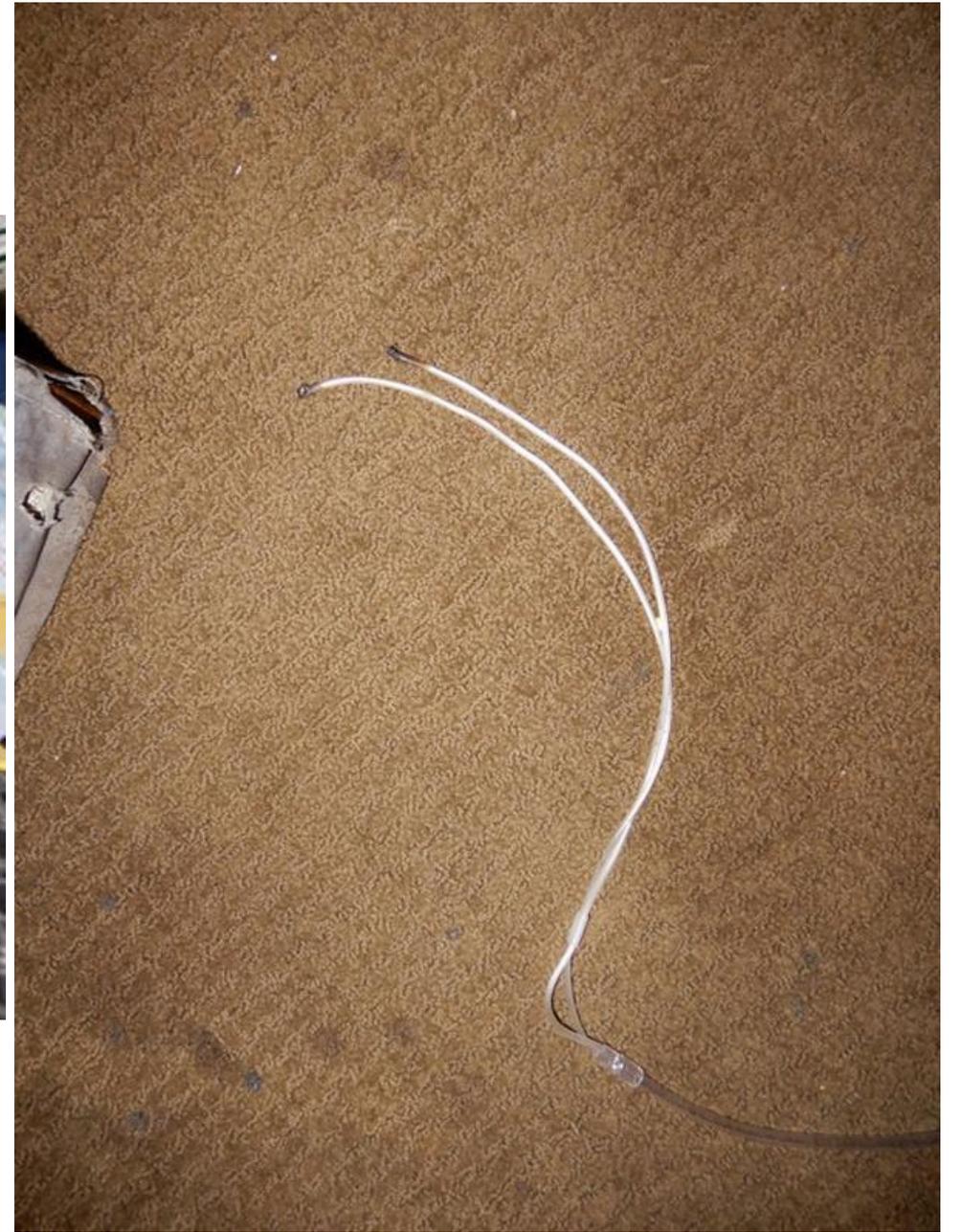
- Blunt force injuries
- Postmortem changes
- Chemical injuries
- Poor hygiene
- Thermal injuries

Answer...

## E. Thermal Injuries (82.76% responses)

Most participants (over 80%) recognized that the decedent suffered from thermal injuries. The decedent had chronic obstructive pulmonary disease (COPD) and was on home oxygen. Unfortunately, he was also still smoking. The first image shows a large amount of soot centered around the decedent's nose and upper lip, as well as several areas of burned facial hair. This is most consistent with a thermal injury. The decedent was smoking cigarettes while wearing a nasal cannula connected to an oxygen tank. The cigarette ignited the oxygen at the site of the cannula (nose), creating the pattern of soot seen on the image. Additional images show the tobacco cigarettes on a nearby table and the burned ends remaining from the nasal cannula he was wearing.

This is a fun case to discuss possible cause/manner/mechanisms of death. The thermal injuries in and of themselves are not lethal. They were predominantly confined to his face, with no significant evidence of injury to the airway and epiglottis. Even if he did die from the injuries themselves, we would not expect him to die immediately. He was found sitting in his recliner, with his cigarettes in front of him and his melted nasal cannula on the floor near him. Without his oxygen, his COPD would certainly be a cause of death, but again would not likely be immediately fatal. You would expect he could at least move and call for help. In addition to his lung findings, he also had a markedly enlarged heart (over 800 g) and severe stenosis of his coronary arteries. It is possible that the event and subsequent thermal injury may have triggered an arrhythmia! Regardless of the extent of his natural disease, the thermal injuries at least contributed to some extent to his death, and thus the manner is best classified as an accident.



## Other Responses:

### A. Blunt force injuries (1.33% responses)

Blunt force trauma can result in contusions, abrasions, lacerations, and fractures. The areas on the tip of the nose and left cheek bone in our picture may look like superficial abrasions but are rather superficial thermal burns with superimposed soot and postmortem drying artifact. The soot surrounding the nose would be easily wiped off as opposed to a real contusion or abrasion.

### B. Postmortem changes (5.01% responses)

Decomposition changes generally include blue-green to eventually brown discoloration and bloating. Decomposition changes would be expected to involve the entire body, although positioning may cause differing degrees of decomposition within the same body. The neck and shoulders of the decedent are visible in our photo and show no decomposition changes.

### C. Chemical injuries (9.68% responses)

Chemical burns can look very similar to thermal burns but given that they are generally caused by corrosive substances, they would not produce soot, which is a result of incomplete burning of organic matter. Charring would also be inconsistent with chemical burns.

### D. Poor hygiene (1.22% responses)

Although poor hygiene can have a variety of appearances, the findings would likely not be as focused or have a specific pattern, as is seen in our image.

# References:

- Edelman DA, Maleyko-Jacobs S, White MT, Lucas CE, Ledgerwood AM. Smoking and home oxygen therapy--a preventable public health hazard. *J Burn Care Res.* 2008 Jan-Feb;29(1):119-22. doi: 10.1097/BCR.0b013e31815f5a3a. PMID: 18182908.