

# Forensic pathology case study: can you stomach this

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Forensic Pathology Case Study: " Can You Stomach This?" Forensic Pathology Case Study: " Can You Stomach This?" At 6: 30 PM, 2 men break into the house of a store manager, while the family is having dinner. The wife is taken as a hostage and taken by the intruders, who demand that the husband go to the safe of the business and take out the days proceeds-- probably about \$25, 000. 00.

The plot goes badly, the money is never transferred, and the woman is found dead in a field the next afternoon at about 16: 00.

Autopsy shows the stomach to be full of partly digested food material. The question arises as to time of death. The physical findings indicate death about 8 hrs previously, and, in fact, a subsequent witness reports he saw her alive in the van at about 07: 00 that same morning.

What factors may account for the food material which showed little evidence of digestion, and no evidence of gastric emptying?

Answer: The woman must have been under stress and fear from the time that the men broke into her house till the period of her death. The body undergoes various physiological changes to cope up with the stress and this is the reason why the food material showed little evidence of digestion and no evidence of gastric emptying. The first and the most important response of the body in times of extreme fear is the activation of the sympathetic nervous system. This accounts for the release of the epinephrine and norepinephrine into the circulation. The activation of the sympathetic nervous system results in a greater amount of blood to flow to the muscles of the body and an increase in the metabolic processes of the body. But it tends to reduce the amount of blood flowing to the gastrointestinal tract. The

sympathetic nervous system restricts the peristaltic activity and tone of the gastrointestinal tract via its alpha one, alpha two and beta two receptors. Furthermore, it raises the tone of the sphincters of the stomach via the alpha one receptor and decreases the secretions of the stomach via the alpha two receptors. These combined effects result in slowing of the digestive process via reduced peristalsis and reduced secretions along with restricting the process of gastric emptying by increasing the sphincter tone (Ganong 2005, 228; Guyton and Hall 2006, 754, 757, 758).

The second effect of stress which alters the gastric emptying is the release of stress hormones. Along with cortisol, glucagon is also a stress hormone. Apart from its effects on the other body organs, glucagon has an inhibitory effect on the stomach. It restricts the release of gastrin in the stomach and thus it alters the normal process of digestion (Ganong 2005, 485). Therefore, the activation of the sympathetic system along with the release of stress hormones accounts for the lack of gastric emptying and minimal digestion in the woman.

What is the potential for error if physiological variations from 'normal' are not taken into consideration?

Answer: The potential for error is significant if the physiological variations from normal in this case are ignored. This is because in a normal individual the time of gastric emptying is one to three hours if the person has consumed a light meal and it may vary from three to eight hours if the person has consumed a heavy and large meal. These values provide for the normal physiological gastric emptying times and useful for concluding regarding the time of death. Another important value for judging the time of

death is the amount of food present in the stomach at the time of autopsy. If ninety percent of the meal consumed is found in the stomach, it is estimated that the time of death is within the fraction of one hour. But in this woman, it can be clearly assessed that her food has not been digested and gastric emptying has not taken place. Also the time of her death is beyond one hour. Thus, if the factor of stress is ignored in this case, the time of her death would be misinterpreted and there is a potential for error of several hours (Payne-James et al 2003, 109, 110).

#### References

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Payne-James, J., Busuttil, A., & Smock, W. S. (2003). Forensic medicine: Clinical and pathological aspects. San Francisco: Greenwich Medical Media.