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CASE REPORT

Risk of pulmonary aspiration during semaglutide use and anesthesia in a fasting patient: a case report with tomographic evidence

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ABSTRACT

Pulmonary aspiration of gastric residues during anesthesia is a potentially fatal complication for which no specific treatment is available. The primary way to prevent its occurrence in the context of elective surgeries is adherence to fasting protocols. However, some clinical conditions can prolong the gastric emptying time, and the risk of aspiration may exist despite adequate fasting. Recognizing the risk factors for gastroparesis allows the adoption of preventive methods and is the primary way to reduce morbidity and mortality from pulmonary aspiration. In this scenario, the anesthesiologist can investigate the gastric content by using ultrasound, adjust the anesthetic technique, and even postpone elective surgeries. Here, we describe incidental computed tomography finding of solid contents in the stomach of a patient without prior identification of the risk factors for gastroparesis. The patient underwent elective renal nodule ablation under general anesthesia after fasting for 9 hours. During the procedure, solid contents in the stomach were noted on computed tomography. Subsequently, it was discovered that the patient had been using semaglutide for 6 days and had not disclosed this information. Semaglutide use may represent a new and significant risk factor for anesthesia-related pulmonary aspiration. Until studies provide information on the appropriate perioperative management of patients using semaglutide, anesthesiologists need to adopt preventive measures to avoid aspiration. Awareness of this potential association and open communication among patients, physicians, and anesthesia teams are essential for enhancing patient safety.

Keywords: Pneumonia aspiration; Respiratory aspiration; Gastroparesis; Semaglutide; Anesthetics; Risk factors; Tomography, X-ray computed

INTRODUCTION

Pulmonary aspiration of gastric contents during anesthesia can lead to chemical pneumonitis, a potentially serious complication for which no specific treatment is available.[1] Preventive actions include adherence to preoperative fasting protocols,[2] identification of patients at high risk for pulmonary aspiration associated with the active investigation of gastric contents by using ultrasound, and adequate anesthetic techniques.[1]

Semaglutide is an increasingly popular drug that was recently approved for the treatment of diabetes and obesity; however, it may lead to gastroparesis.[3] The lack of information in the medical literature regarding perioperative management in semaglutide users raises safety concerns. Here, we describe

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incidental computed tomography finding of solid contents in the stomach of a patient using semaglutide in whom the risk factors for gastroparesis were not identified.

CASE REPORT

A 66-year-old man was admitted to the interventional medicine ward for elective treatment of a renal nodule with computed tomography-guided percutaneous microwave ablation, which was incidentally diagnosed as an oncocytoma. In the preanesthetic evaluation, the patient's medical history included grade 1 obesity with a body mass index of 31.2kg/m^2, He did not mention the use of medication. Recent laboratory tests revealed normal renal function, coagulograms, and blood count. No predictors of a difficult airway were identified. Physical examination did not reveal alterations, and the last intake of solids and liquids occurred 9 hours before the procedure. After standard monitoring, at the anesthesiologist's discretion, rapid sequence anesthetic induction and orotracheal intubation with a number 7.5 tube were performed without intercurrences. Anesthetics administered during anesthetic induction were propofol 2mg/kg, fentanyl 2mcg/kg, and rocuronium 1.2mg/kg, and for maintenance of anesthesia, remifentanil and sevoflurane, with dose titration guided by monitoring of the level of consciousness with bispectral index were administered. No additional rocuronium dose was administered. The patient was ventilated in volume-controlled mode with a tidal volume of 6mL/kg of predicted weight and positive end-expiratory pressure of 4cmH_2O, maintaining hemodynamic and ventilatory stability throughout the procedure. Prophylaxis for nausea and vomiting was administered intravenously with 8mg of ondansetron and 8mg of dexamethasone. For postoperative analgesia, the patient received 2g of intravenous dipyrone and 10mg of oxycodone orally, 30 minutes before the procedure. After initiating the procedure, the interventional radiologist alerted the anesthesiologist about the presence of solid stomach contents. Using tomographic images, the radiologist estimated the gastric content volume to be 931.8mL (Figures 1 and 2). To accelerate gastric emptying, 10mg of bromopride was administered intravenously, and an orogastric tube was inserted to remove the contents. The gastric content was very thick, and removal was unsuccessful.

The procedure lasted 120 minutes and was uneventful. The patient was extubated when awake and after the administration of sugammadex at a dose of 4mg/kg.

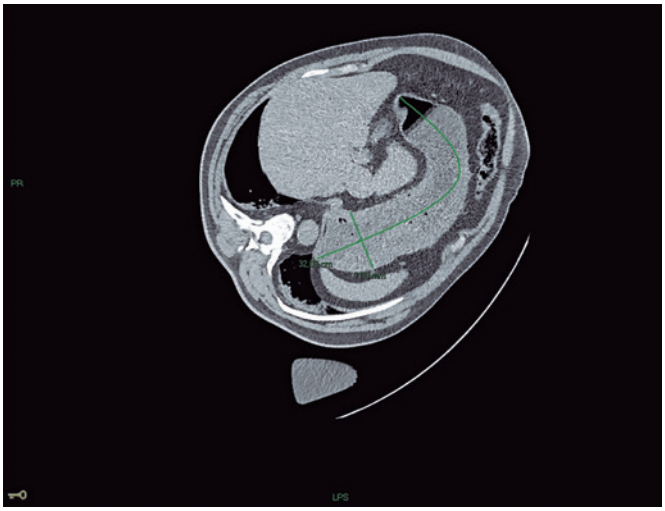

Figure 1. Tomographic image with estimated gastric volume of 931.8mL

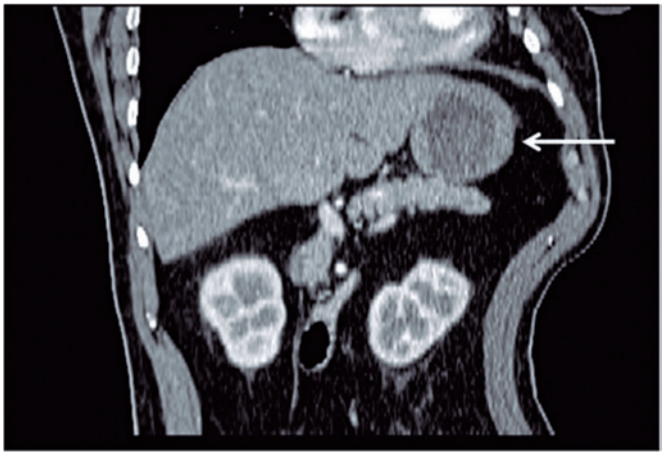

Figure 2. Tomographic image with solid contents in the stomach

During anesthetic recovery, the patient and family members were asked again about adherence to the fasting protocol and medication use. The patient reiterated fasting for 9 hours; however, a family member recalled that 6 days ago, he had used 0.5mg of semaglutide subcutaneously, for weight loss. The patient stated that he did not consider it important to report the use of the medication at the time of the preanesthetic interview, as he had used it six days before. The patient did not experience any discomfort during recovery from the anesthesia and was discharged the day after the procedure, as planned.

The work was approved by the Research Ethics Committee of *Hospital Israelita Albert Einstein* (CAAE: 67763123.4.0000.0071; # 5.981.496).

DISCUSSION

Pulmonary aspiration of gastric contents is the main cause of death and permanent disability associated with anesthesia.[1] According to recent evidence, 55% of aspirations occur in elective surgical procedures,[1] indicating a failure to identify patients with a full stomach before anesthesia. With the advent of gastric ultrasonography, it has become possible to confirm the presence of food in the stomach and postpone elective procedures accordingly.[4,5] Furthermore, in hospitals that do not have this technology or in emergency surgery, the risk of aspiration can be mitigated through the insertion of the nasogastric tube and removal of gastric contents. There is a preference for regional anesthesia over general anesthesia, rapid sequence anesthetic induction, or intubation while the patient is awake.[4]

A critical scenario for aspiration is when an anesthesiologist does not identify a patient at risk for pulmonary aspiration. In the present case, despite the lack of suspicion of a full stomach, the anesthesiologist's preference for rapid sequence induction may have contributed to a favorable outcome. Furthermore, localized renal neoplasia without changes in renal function is neither considered a risk factor for gastroparesis nor grade 1 obesity.[1]

Based on the mechanism of action of semaglutide and other drugs in the same class, the most frequent side effects are weight loss and nausea.[3] While there is no scientific evidence that elucidates the perioperative management of patients using semaglutide and other glucagon-like peptide-1 receptor agonists, it is prudent to consider the high risk of pulmonary aspiration in all of these cases, regardless of fasting time. In this context, gastric ultrasound has emerged as a valuable tool with the potential to help detect stomach contents and improve outcomes.[5]

To prevent anesthesia-related pulmonary aspiration, it is important to actively investigate the use of medications that may reduce gastric emptying time. In the case of semaglutide, owing to its weekly dosage on the day of the surgical procedure, the patient may not remember taking the medication. Furthermore, the lack of requirement of a medical prescription for the sale of these drugs, associated with their use for aesthetic purposes, may lead the patient not to consider semaglutide as an important drug to be mentioned in the preanesthetic evaluation. Studies should be performed to clarify perioperative management related to the use of glucagon-like peptide-1 receptor agonists. It is important to establish the appropriate duration of fasting to ensure complete gastric emptying in patients who cannot stop the medication and to determine the period of drug withdrawal before surgery to allow the effects of gastroparesis to disappear.

Our findings in this case suggest that an 8-hours fasting period may be insufficient for gastric emptying in patients using semaglutide. To minimize the risk of pulmonary aspiration, it is important to be aware of this possible association, adopt preventive measures, and actively investigate the past and present use of semaglutide and other drugs of the same pharmacological class.

AUTHORS' CONTRIBUTION

Veronica Neves Fialho Queiroz and Priscila Mina Falsarella: conceptualization, data curation, methodology, writing – original draft. Renato Carneiro de Freitas Chaves: conceptualization, methodology, writing – review, and editing. Flávio Takaoka: conceptualization, writing – review, and editing. Luis Ricardo Socolowski: data curation and writing the original draft. Rodrigo Gobbo Garcia: conceptualization, writing, reviewing, and editing.

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