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GENERAL ANESTHESIA COMPLICATIONS: ARTICLE REVIEW

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Abstract:
General anesthesia is a vital component of modern surgical practice; it is accompanied by a spectrum of side effects that require careful consideration and management. Understanding these potential complications, including patient injuries, ADRs, and specific postoperative effects, is crucial for improving patient outcomes and ensuring the safety of anesthetic practices. Continuous education and vigilance in monitoring patients during and after anesthesia are essential to minimize these risks and enhance the overall efficacy of surgical interventions.

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INTRODUCTION:

General anesthesia is predominantly regarded as safe, and individuals with considerable health conditions may also partake in procedures administered under general anesthesia. It is essential for many surgical procedures and is associated with a range of side effects that can vary in severity. One of the most significant concerns is the occurrence of patient injuries, which can manifest as both mild and severe reactions to the anesthetic agents used. (1) These injuries may not be directly linked to the underlying condition being treated but rather arise as side effects of the anesthesia itself. A critical aspect of anesthesia-related complications is the risk of adverse drug reactions (ADRs), which include overdose, idiosyncratic reactions, and allergic responses. Overdose, in particular, has been identified as a major contributor to anesthetic mortality, accounting for a notable percentage of cases. (2) The American Society of Anesthesiologists (ASA) classification is a widely recognized system used to assess the physical status of patients prior to anesthesia and surgery [Table1]. This classification categorizes patients into six classes, ranging from I (healthy) to VI (brain-dead organ donor), with an emergency modification (E) applicable to classes I to V for those requiring urgent surgical intervention due to life-threatening conditions. (3) The primary purpose of the ASA classification is to evaluate perioperative risk, which is crucial for guiding clinical decision-making and improving patient outcomes. Research has shown that ASA classes correlate with postoperative outcomes, including the length of stay in the intensive care unit (ICU) and overall hospitalization duration. For instance, patients classified as ASA I typically have a shorter ICU stay of about 0.1 days, while those in ASA IV may require nearly four days, with hospitalization extending from an average of 11.8 days to 27.3 days, respectively. (4)

Non-cardiac Complication:

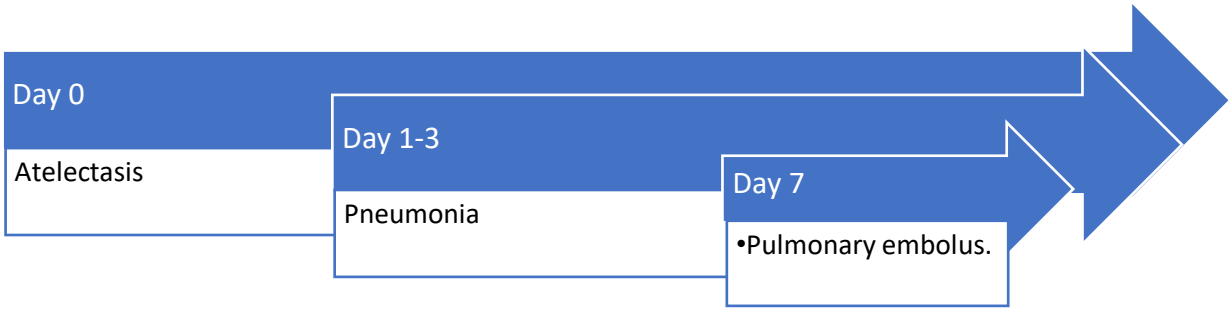
General anesthesia, while essential for many surgical procedures, can lead to a range of non-cardiac complications that significantly impact patient outcomes. Among these, postoperative nausea and vomiting (PONV), which can arise from the use of inhalational anesthetics, is one of the most prevalent, affecting up to 30% of patients and contributing to discomfort and dissatisfaction post-surgery. This condition can lead to increased morbidity, including dehydration and aspiration, if not managed effectively. (5)

Respiratory complications are also prevalent, with pneumonia and aspiration being notable examples. Inhalational anesthetics may contribute to these issues, particularly in patients with preexisting pulmonary conditions. The risk of pneumonia is heightened due to reduced airway protection during anesthesia, which can lead to aspiration pneumonitis, a serious condition resulting from inhaling stomach contents. Additionally, atelectasis, or the collapse of lung tissue, is another common postoperative problem that can arise from the effects of inhalational agents. (6) Pulmonary embolism (PE) is also one of the most common general anesthesia due to several interrelated factors, including immobilization, obesity, smoking, and lack of thromboprophylaxis. A study demonstrated that prolonged general anesthesia, particularly when exceeding 3 h, is considerably associated with an increased risk of PE. (7, 8) Other complications include postoperative sore throat and hoarseness, which patients frequently report after intubation. These symptoms can detract from overall patient satisfaction and are attributed to trauma to the airway mucosa during the insertion of endotracheal tubes or laryngeal masks.(9) Low cardiac output syndrome (LOS) is another critical condition that can arise postoperatively, particularly after cardiac surgery. LOS is characterized by inadequate blood flow from the heart, which can lead to multiple organ dysfunction. (10) This condition underscores the importance of hemodynamic stability during and after surgical procedures. Furthermore, patient risk factors such as age, comorbidities, and pre-existing heart conditions significantly influence the likelihood of experiencing cardiac complications after anesthesia.

ASA class	Definition
I	A healthy person under the age of 65 years.
II	A healthy person over the age of 65 years or a person with mild systemic disease
III	person with severe, non-life-threatening systemic disease.
IV	A person with a severe systemic disease that constantly threatens life.
V	Moribund patient, who is not expected to live more than 24 h without an operation.
VI	A declared brain-dead patient whose organs are being removed for donor purposes.

Table (1): American Society of Anesthesiologists classification

Figure (1): Timeline of respiratory-related general anesthesia complications.



One of the most severe complications is death, which can occur due to various factors, including failure to regain consciousness after anesthesia or surgery. This can stem from conditions such as delayed anesthetic recovery, postoperative delirium, or even persistent coma. Delayed anesthetic recovery specifically refers to a prolonged period before a patient regains consciousness, which can be distressing and indicative of underlying issues. (11) Postoperative delirium is another significant concern, characterized by confusion and altered mental status. This condition can arise after general anesthesia and is often exacerbated by the effects of inhalational anesthetics, which may lead to symptoms such as headache and emergence excitement. (6, 11) The presence of delirium can complicate recovery and prolong hospital stays, making early detection and management essential.

Cardiac Complication:

Cardiac complications following general anesthesia are a significant concern, particularly for patients with preexisting heart conditions. Among these complications, perioperative myocardial infarction (MI) is notably prevalent, especially in individuals with a history of coronary artery disease. Studies indicate that approximately 6% of patients with prior myocardial infarction or significant coronary artery disease exhibit signs of myocardial injury during or after surgery and anesthesia. (6, 12) This highlights the critical need for healthcare professionals to monitor cardiac health closely in these patients to facilitate early detection and intervention. In addition to myocardial infarction, other cardiac complications such as cardiac arrest and arrhythmias can occur during or after anesthesia. Cardiac arrest, characterized by a sudden loss of heart function, has been documented in a small percentage of anesthesia cases, with a reported incidence of 1.1 per 10,000 cases. (13, 14) While most intraoperative cardiac arrests are not directly attributable to anesthesia, the risk remains elevated in high-risk patients, necessitating vigilant monitoring and preparedness for resuscitation. Arrhythmias, or irregular heartbeats, are another common postoperative complication, particularly in patients with existing heart conditions. These arrhythmias can lead to serious outcomes, including increased morbidity and mortality. The management of these arrhythmias requires a thorough understanding of their triggers and the effects of anesthetic agents on cardiac function. Continuous ECG monitoring during anesthesia is essential for early detection and management of these complications, although the cost-effectiveness of such monitoring has been debated. (15) Therefore, a comprehensive preoperative assessment is vital to identify at-risk patients and implement appropriate perioperative management strategies to minimize these risks.

CONCLUSION:

The ASA classification provides a vital framework for assessing patients' physical condition before surgery, facilitating risk evaluation and informed clinical decision-making. Nevertheless, its limitations require thoughtful consideration and the incorporation of additional evaluative tools to ensure optimal patient care results. The incidence of postoperative complications following general anesthesia is complex, involving challenges such as postoperative nausea and vomiting (PONV), respiratory issues like atelectasis, pneumonia, and aspiration, sore throat, hoarseness, altered mental status, and emergence complications. Recognizing these risks is crucial for healthcare professionals to develop effective management strategies that improve patient outcomes after surgery. By addressing these complications proactively, the overall standard of postoperative care can be enhanced, leading to more favorable recovery experiences for patients. The range of cardiac complications that can arise after general anesthesia is extensive, including myocardial infarction, cardiac arrest, arrhythmias, and low cardiac output syndrome. Recognizing these risks and applying

frequent monitoring and management protocols are crucial for enhancing patient outcomes in the perioperative environment.

REFERENCES:

1. Leykin Y, Noal N, editors. Side Effects Induced by Anaesthetic Manipulation or by Surgical Operation2008; Milano: Springer Milan.
2. Naguib M, Magboul MMA, Jaroudi R. Adverse Effects of General Anaesthetics. CNS Drugs. 1998;10(2):119-44.
3. Lone PA, Wani NA, Ain QU, Heer A, Devi R, Mahajan S. Common postoperative complications after general anesthesia in oral and maxillofacial surgery. Natl J Maxillofac Surg. 2021;12(2):206-10.
4. Menke H, Klein A, John KD, Junginger T. Predictive value of ASA classification for the assessment of the perioperative risk. Int Surg. 1993;78(3):266-70.
5. Lewis S, Salem G, Khater M. Recent advances in the management of postoperative nausea and vomiting. Journal of Operating Department Practitioners. 2015;3(2):62-5.
6. Boucher BA, Witt WO, Foster TS. The postoperative adverse effects of inhalational anesthetics. Heart Lung. 1986;15(1):63-9.
7. Xu J, Yu X, Shi Y, Chen F, Wang L, Weng J, et al. Effect of general anesthesia on postoperative pulmonary embolism. Ann Med. 2025;57(1):2530228.
8. Endoh M, Yamanaka I, Munetsugu Y. [Massive pulmonary thromboembolism during an orthopedic surgery in an obese patient]. Masui. 2013;62(10):1203-6.
9. Chen CY, Kuo CJ, Lee YW, Lam F, Tam KW. Benzydamine hydrochloride on postoperative sore throat: a meta-analysis of randomized controlled trials. Can J Anaesth. 2014;61(3):220-8.
10. Beppu S, Sakakibara H, Tanaka N, Miyatake K, Nagata S, Park Y-D, et al. Prediction and Diagnosis of Low Cardiac Output Syndrome After Open-Heart Surgery: An Echocardiographic Study. In: Manabe H, Zweifach BW, Messmer K, editors. Microcirculation in Circulatory Disorders. Tokyo: Springer Japan; 1988. p. 95-101.
11. Zandstra DF, Kuiper M, editors. Failure to Regain Consciousness After Anesthesia2000; Milano: Springer Milan.
12. Erol DD, Ozen I. Is general anesthesia a risk for myocardium? Effect of anesthesia on myocardial function as assessed by cardiac troponin-i in two different groups (isofluran+N2O inhalation and propofol+fentanyl iv anesthesia). Vasc Health Risk Manag. 2007;3(5):755-8.
13. Nunes JC, Braz JRC, Oliveira TS, de Carvalho LR, Castiglia YMM, Braz LG. Intraoperative and Anesthesia-Related Cardiac Arrest and Its Mortality in Older Patients: A 15-Year Survey in a Tertiary Teaching Hospital. PLOS ONE. 2014;9(8):e104041.
14. An JX, Zhang LM, Sullivan EA, Guo QL, Williams JP. Intraoperative cardiac arrest during anesthesia: a retrospective study of 218,274 anesthetics undergoing non-cardiac surgery. Chin Med J (Engl). 2011;124(2):227-32.
15. Oyama MA. Perioperative Monitoring of Heart Rate and Rhythm. Veterinary Clinics of North America: Small Animal Practice. 2015;45(5):953-63.