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Anesthesia and Enhanced Recovery for Robotic Living Donor Hepatectomy

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DESCRIPTION

General anesthesia is a medical procedure that induces a state of unconsciousness and lack of sensation in the body, allowing for medical interventions to be performed without causing discomfort or pain to the patient. This complex process involves the use of various medications, monitoring equipment, and specialized techniques to ensure the safety and well-being of the patient throughout the procedure. In this article, we will explore the mechanisms of action of general anesthesia, as well as some of the challenges that can arise during this critical medical intervention. However, it is known that the process involves the modulation of neuronal activity in the Central Nervous System (CNS). This modulation can occur at various levels, including the spinal cord, brainstem, and cerebral cortex. One of the primary mechanisms of action of general anesthesia is the enhancement of inhibitory neurotransmission in the CNS. This occurs through the activation of GABA-A receptors, which are present throughout the brain and spinal cord. When activated, these receptors increase the influx of chloride ions into neurons, which leads to hyperpolarization and a decrease in neuronal activity. This results in a state of sedation, hypnosis, and amnesia. In addition to enhancing inhibitory neurotransmission, general anesthesia also inhibits excitatory neurotransmission in the CNS. This occurs through the blockade of NMDA receptors, which are involved in the regulation of synaptic plasticity and learning and memory. When NMDA receptors are blocked, the flow of calcium ions into neurons is reduced, which leads to a decrease in excitatory activity. Another important mechanism of action of general anesthesia is the modulation of ion channels and membrane proteins that are involved in the regulation of neuronal activity. For example, some anesthetic agents are known to interact with voltage-gated potassium channels, which can lead to hyperpolarization and a decrease in neuronal activity. Other anesthetic agents can interact with sodium channels, calcium channels, and other membrane proteins to produce their effects. Finally, general anesthesia also affects the activity of various neurotransmitter systems in the brain. For example, some anesthetic agents are known to modulate the release and reuptake of dopamine, norepinephrine, and other neurotransmitters, which can lead to changes in mood, arousal, and other aspects of consciousness. Despite the widespread use of general anesthesia in modern medicine, there are still many challenges and risks associated with this procedure. The pharmacokinetics of anesthetic agents can vary widely between patients, which can make it difficult to achieve and maintain the desired level of anesthesia. General anesthesia can cause changes in blood pressure, heart rate, and other hemodynamic parameters, which can lead to cardiovascular instability and other complications. This is particularly true in patients with pre-existing cardiovascular disease. General anesthesia can cause respiratory depression, which can lead to hypoxia, hypercapnia, and other complications. Some patients who undergo general anesthesia can experience postoperative cognitive dysfunction, which is characterized by deficits in memory, attention, and other cognitive functions. The exact causes of this condition are still not fully understood. Some patients can develop anaphylaxis, a severe allergic reaction, in response to one or more of the components of general anesthesia. This can be life-threatening and requires immediate treatment.

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CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.

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