Management of Acute Postoperative Pain after Oral Surgery

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KEYWORDS

• Oral surgery • Pain management • Postoperative pain
• Acute pain

Pain after oral surgical procedures is one of the most studied models in pharmacology and pain research. Sensory nociception in the head and oral cavity is disproportionately greater than in most other areas of the body. Because of this phenomenon, appropriate preemptive and postoperative pain management is critical to achieve a successful outcome. This article provides the practitioner with a brief review of the acute pain mechanism as it relates to the effects of a surgical insult. An understanding of the physiologic modulation of acute pain establishes a rational framework for the concept of preemptive and postoperative analgesia. A brief review of commonly used analgesic agents is presented. Research in pain management and new drug development is ongoing as new concepts in neurophysiology and pharmacology are being elucidated.

ACUTE PAIN MECHANISMS

When examining how to manage acute postoperative pain in the oral and maxillofacial surgery patient, it is important to review the physiologic mechanisms involved in acute

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postsurgical pain. Webster's dictionary describes pain as a basic bodily sensation induced by a harmful stimulus characterized by physical discomfort.[1] When tissue homeostasis is disrupted by a surgical insult, autonomic, hormonal, and chemical changes that play a role in the subjective perception of pain are observed physiologically.

This article does not address every detail involved in the acute pain mechanism. Nonetheless, a simplified understanding of the neurophysiology of acute pain is important when reviewing pharmacotherapy **Tables 1** and **2**.

Peripheral pain stimuli are initially encountered at the nociceptor level on skin, joint, or end-organ surfaces where they are processed and transmitted via first-order neurons to the dorsal horn neurons of the spinal cord. These first-order neurons vary in width and composition. These nerve fibers are classified into 2 general subtypes: A and C. A fibers tend to be myelinated and fast conducting, whereas C fibers tend to be unmyelinated, slower-conducting fibers. A fibers produce a more localized sharp pain, whereas C fibers produce a dull, poorly localized ache. These primary afferent fibers, through the release of specific neurotransmitters, transmit sensory information to the dorsal horn neurons of the spinal cord.

The spinal cord is comprised of various laminae, numbered 1 through 10. These laminar tracts are comprised of specific types of second-order neurons, each varying in function. Examples of dorsal horn neurons include nociceptive specific cells (NS), wide dynamic range cells (WDR), complex cells, viscerosomatic cells, and others. NS cells are specific for a small receptive field and respond to high-threshold noxious stimuli. Conversely, WDR cells respond to a wide spectrum of stimuli, receiving mainly multisynaptic input from both A and C fibers. WDR cells have a wider receptive field than NS cells. Complex, viscerosomatic, and other types of dorsal horn neurons may play excitatory and inhibitory roles on pain stimulus transmission while having various receptive field sizes and pain characteristics.[2]

Depending on the afferent fiber type and the neurotransmitters involved, primary afferent stimuli are directed to specific laminae within the spinal cord where they are processed and transmitted, via the spinothalamic tract, to the brain. Information is transmitted to third-order neurons in the thalamus for further processing. Afferent information is then relayed to the somatotopic areas of the cerebral cortex, where conscious pain perception arises. It is at this sophisticated supraspinal level that

Table 1
Commonly used oral narcotic analgesics

Drug	Trade Names	Usual Dose	Combination Drug
Codeine	Empirin with codeine Tylenol with codeine	30–60 mg	Aspirin (325 mg) Acetaminophen (300–650 mg)
Hydrocodone	Lortab, Norco, Vicodin, Maxidone	5.0, 7.5, 10.0 mg	Acetaminophen (500–750 mg)
Hydromorphone	Dilaudid	1–4 mg	
Oxycodone	Percocet, Percodan, Roxicet, Roxiprin, Tylox	2.25–5.0 mg, 7.5 mg	Acetaminophen (300–500 mg) Aspirin (325 mg)
Pentazocine	Talacen, Talwin	12.5–25.0 mg	Acetaminophen (650 mg) Aspirin (325 mg)
Meperidine	Demerol	50–150 mg	None

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