

POST-OPERATIVE ORAL LESIONS

FACT FILE

GENGI|GEL[®]
Hyaluronic Acid



HOW CAN POST-OPERATIVE LESIONS AFFECT ORAL HEALTH?

Post-operative oral lesions can significantly influence oral health, with both direct and indirect consequences on physical and psychological well-being (Koray & Tosun 2019; Villanueva-Vilchis et al., 2016). Indeed, these lesions, resulting from surgical interventions within the oral cavity, often cause substantial pain and discomfort. This condition can hinder patients' ability to perform essential activities, such as eating, speaking, and maintaining proper oral hygiene, potentially leading to subsequent dental issues.

Post-operative lesions compromise the integrity of the oral mucosa, resulting in heightened sensitivity and an increased risk of secondary conditions such as ulcers and gum inflammations

(Fitzpatrick et al., 2019; Koray & Tosun 2019; Suchetha, 2018; Kirmani et al., 2016). Furthermore, maintaining oral hygiene becomes particularly challenging in the presence of post-operative lesions, as brushing and flossing around sensitive or painful areas can be nearly impossible. This difficulty can lead to plaque accumulation, gingivitis, and periodontal disease.

Post-operative lesions are recognised as a major factor impairing oral health-related quality of life (OHRQoL), a

Post-operative lesions can lead to dental issues

multidimensional construct reflecting individuals' comfort while eating, sleeping, and engaging in social interactions, as well as their self-esteem and satisfaction with their oral health (Al Shamrany, 2006). The difficulty in effectively treating these lesions and their heightened risk of infection are primary concerns (Kirmani et al., 2016). Additionally, lesions such as ulcers and gum inflammations can retard the healing process at the surgical site, prolonging patient discomfort and increasing the likelihood of complications (Kirmani et al., 2016; Villanueva-Vilchis et al., 2016).

Post-operative lesions significantly impact quality of life

Hence, **effective management of post-operative lesions is essential** to mitigate these adverse effects. This management includes vigilant monitoring for signs of infection, ensuring adequate pain control, and maintaining meticulous oral hygiene to facilitate healing and prevent complications (Lertpimonchai et al., 2017; Peñarrocha et al., 2000). Regular follow-up with dental professionals is crucial for promptly addressing any emerging issues and supporting optimal oral health during the recovery period. **By addressing both the physical and psychological aspects of post-operative lesions, patients can achieve improved outcomes and maintain overall oral health** (Pippi, 2017).

HOW TO PREVENT COMPLICATIONS FROM UNTREATED POST-OPERATIVE ORAL LESIONS?

Untreated post-operative oral lesions can lead to a range of complications that affect both local oral health and overall systemic health. The most common complications include **infection, delayed healing, pain, and functional impairments**. The main variable in the resolution of post-operative oral discomfort is correct wound healing, which consists of four intricately tuned phases: haemostasis, inflammation, proliferation, and remodelling. Multiple factors can interfere with one or more of these phases, resulting in impaired bone and soft tissue healing (Shah et al., 2020).

Several individual factors influence this process, including age, stress, consumption of alcohol or tobacco, obesity, malnutrition, and diabetes (Shah, 2020). Particularly in these vulnerable patients, mismanaged post-operative oral lesions can lead to significant pain, infection, and undesirable healing outcomes such as scarring and adhesion to adjacent tissues. **These complications may cause sig-**

Good oral hygiene can reduce post-operative pain and analgesic use by 30%

nificant deficits in functions essential for daily life, including deglutition (swallowing), articulation, speech, and respiration (Fitzpatrick et al., 2019; Suchetha et al., 2018; Kirmani et al., 2016; Villanueva-Vilchis et al., 2016).

Moreover, such complications can necessitate additional surgeries or prolonged hospitalization (Askar et al., 2019), leading to an extended recovery period. **Pharmacologic treatments, such**

as analgesics and antibiotics, are often prescribed to manage these complications, but they come with their own known side effects (Rao, 2021). This issue is particularly relevant for vulnerable patients who are at a higher risk of experiencing these complications.

The best and easiest way to manage complications—and avoid the use of pharmacologic treatments—is to prevent them from occurring in the first place (Peterson, 1998) and **the use of non-pharmacological topical treatments represents valuable benefits**, providing effective and saf-

er alternatives or complements to traditional pharmacological therapies. Moreover, it is crucial to provide patients with clear and precise instructions about risk factors and best practices before and after surgery. For instance, maintaining good oral hygiene before and after surgery is fundamental to reducing the risk of post-operative pain and the subsequent need for analgesics (Peñarrocha et al., 2000).

Additionally, patients should be reminded not to take any medications without the recommendation of a healthcare professional. Surgeons also play a critical role by planning the appropriate surgical procedure and thoroughly review-

ing the patient's medical history (Peterson, 1998).

In summary, untreated post-operative oral lesions can lead to severe and multifaceted complications, including infections, delayed healing, pain, functional impairments, and aesthetic issues. These complications can extend recovery periods, necessitate additional treatments, and significantly impact patients' quality of life. **Preventive measures, proper patient education, and meticulous surgical planning are essential** to mitigate these risks and ensure optimal healing and recovery.

WHY RESORT TO NON-DRUG TREATMENTS?

Untreated post-operative oral lesions often necessitate pharmacological intervention to manage associated complications. Analgesics are typically prescribed for pain management; however, their routine use may not always be optimal for addressing all issues arising from post-operative discomfort. Similarly, while nonsteroidal anti-inflammatory drugs (NSAIDs) are crucial for addressing inflammation, their prescription should be limited due to well-documented side effects (Banerjee et al., 2023; Argoff, 2013). On the other hand, antibiotics are essential for managing infections, yet their use should be minimized to combat the growing concern of antibiotic resistance (Rao, 2021).

These considerations are particularly relevant for patients at higher risk of complications following oral surgery. Such individuals are often concurrently receiving multiple medications, raising concerns about potential pharmacologic interactions and heightened adverse effects.

Moreover, in light of these challenges associated with pharmacological interventions, non-drug treatments present compelling alternatives. Among these alternatives, **non-pharmacological topical treatments play a signif-**



icant role, particularly when they act as film-forming on the wound. These treatments create a **physical barrier that shields the wound from external contaminants**, thereby reducing the risk of bacterial ingress and facilitating the healing process (Sridharan & Sivaramakrishnan, 2021;

Chen & Abatangelo, 1999). In addition to their barrier function, non-pharmacological topical treatments offer additional benefits for patients. **They provide relief from discomfort and pain associated with oral lesions, potentially reducing the reliance on analgesics or anti-inflammatory drugs.** Furthermore, these treatments are often **well-tolerated and have minimal side effects**, making them suitable options for patients

with diverse medical histories (Lau & Smith, 2022; Al-Maweri et al., 2021; Casale et al., 2017).

Overall, the use of non-pharmacological topical treatments represents a valuable strategy in the management of post-operative oral lesions. **By embracing these alternatives, healthcare providers can optimize patient outcomes, reduce the burden of pharmacological interventions, and promote efficient and effective wound healing.**

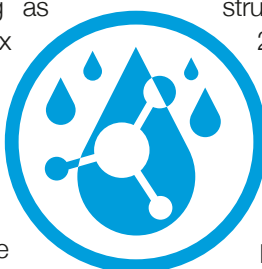
WHY HIGH MOLECULAR WEIGHT HYALURONIC ACID?

HA is a non-sulphated glycosaminoglycan (GAG) extensively distributed in neural, epithelial, and connective tissues, including the periodontium. Serving as a major constituent of the extracellular matrix (ECM), **HA substantially contributes to tissue regeneration, inflammatory response, and angiogenesis, and plays a pivotal role in wound healing** (Graça et al., 2020). Remarkably hygroscopic, HA exhibits notable viscoelastic properties, thereby impeding the infiltration of viruses and bacteria into tissues (Casale et al., 2016).

The properties of HA are directly related to its molecular weight. High molecular weight hyaluronic acid (HMW-HA) inhibits cell differentiation and promotes cell proliferation, and

is involved in tissue regeneration, wound healing, epithelial integrity, embryogenesis, plasma protein distribution, matrix structuring and water homeostasis (Valachová et al., 2021).

HMW-HA has a remarkable hydration capacity and can swell to many times its original volume upon water uptake, improving tissue hydration and cell resistance to mechanical damage. This biopolymer is commonly used in the treatment of gingivitis, recession, and periodontal pockets due to its properties, and as a component of grafts and implants (Iviglia et al., 2019). In addition, **HA can act as a stable barrier against viral and bacterial invasion, promoting regeneration in oral cavity diseases** (Iviglia et al., 2019).



Why Gengigel®?

Hyaluronic acid deficiency resulting from oral tissue injury leads to free water imbalance and delayed healing. **Gengigel®, with its HMW-HA-based composition, protects the oral mucosa by promoting the natural healing and recovery process of the tissue.** Thanks to its bioadhesive and film-forming properties, it forms a stable barrier that preserves the microenvironment of the mucosal surface and accelerates mucosal healing by maintaining the action of HMW-HA over a long period while delaying the absorption and excretion of HMW-HA. The ability of HMW-HA to retain large amounts of water helps Gengigel® maintain extracellular fluid balance and promote oedema resorption in inflammatory conditions, providing rapid relief to inflamed oral tissues. Importantly, hyaluronic acid **has no local or systemic pharmacological effects on the mucosa, presenting a significant advantage in the management of post-operative oral lesions for the entire population.**

A recent systematic review of 38 randomized clinical trials reported that the concomitant use of HA in gingivitis (8), nonsurgical (20) and surgical (10) periodontal therapy improved patients' clinical

parameters, including periodontal probing depth, periodontal inflammation, and clinical attachment level (gingival recession) while reducing the prescription of nonsteroidal anti-inflammatory drugs (Karakostas et al., 2022).

Clinical evidence on Gengigel® encompasses data from high-quality prospective comparative studies (Ibraheem et al., 2022; Al-Shammari et al., 2018; Gupta 2017; Polepalle et al., 2015). The studies covered various indications for Gengigel®, including the treatment of clinical signs associated with periodontal disease and gingivitis following surgical periodontal therapy or the healing of extraction wounds or of post-operative oral lesions. Application modes ranged from single-use at the time of surgery to multiple applications post-surgery/treatment.

Gengigel® was shown to be an effective treatment for restoring healthy gums and controlling the inflammatory process at various stages of periodontal disease, providing a beneficial effect on early post-operative healing following extraction.



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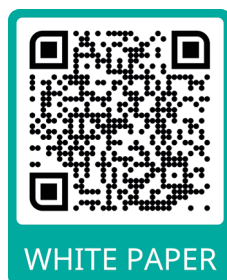
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