

CARCINOGENESIS FROM A STOMATOLOGIC PERSPECTIVE: ROLE OF HYPOXIA IN TUMOR DEVELOPMENT

Carlos Mas Bermejo
Stomatologist

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Stomatology, defined by the Royal Spanish Academy as the branch of medicine that deals with diseases of the mouth, includes the study, diagnosis, prevention and treatment of pathologies of the stomatognathic apparatus. Within its competencies, the evaluation of maxillofacial growth and development in children and adults is fundamental, since alterations in these structures have a profound impact on systemic health and in processes such as carcinogenesis.

The upper jaw plays a central role in balanced maxillofacial development. Individuals with disproportionate growth in the vertical plane (dolichocephalic) have a narrow maxilla and an “adenoid facies” in infancy. This condition, commonly associated with mouth breathing, leads to a series of functional and structural alterations:

MOUTH BREATHING AND ITS IMPACT ON MAXILLOFACIAL GROWTH

Mouth breathing, a consequence of narrow upper airways, is associated with atypical swallowing that prevents adequate transverse growth of the maxilla and its related structures, such as the nostrils and cranial bones (ethmoid, sphenoid, occipital and frontal). This perpetuates an elongated face and poor functionality of the upper respiratory system.

CHRONIC INTERMITTENT HYPOXIA: A BRIDGE TO CARCINOGENESIS

Mouth breathing generates chronic intermittent hypoxia, due to the reduction of nitric oxide in the maxillary sinuses, a key compound in vasodilation, bronchodilation and optimization of alveolar gas exchange. Sustained hypoxia has multisystemic repercussions that include cardiovascular, metabolic, muscular and digestive dysfunction.

From a stomatological point of view, it is crucial to note that chronic intermittent hypoxia is also linked to carcinogenesis. Hypoxia-inducible factors (HIFs) play a key role in tumor progression, promoting cell survival, invasiveness, metastasis and resistance to antitumor therapies.

HYPOXIA AND METABOLIC ALTERATIONS IN CELLULAR RESPIRATION

Hypoxic conditions impair cellular respiration and the Krebs cycle, alterations that could contribute to the transformation of normal cells into cancer cells. This underlines the need to intervene in the management of hypoxia as a preventive and therapeutic strategy against cancer.

CONCLUSION

Mouth breathing, common since childhood, not only affects the functionality of the stomatognathic system, but has profound systemic implications, including its contribution to the tumor microenvironment. The correction of this alteration could become a key intervention in the prevention and treatment of cancer, offering greater chances of survival to patients.