Prolyl hydroxylase inhibition to reduce wound ischemia after skin incisions

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Value Proposition

Skin flap ischemia and necrosis remain significant challenges for patients and surgeons. Poor vascular perfusion resulting from the surgery itself is often exacerbated by comorbid conditions such as diabetes, poor nutrition, or radiation therapy, and can result in surgical complications and skin flap failure. A method to improve perfusion to skin flaps may improve surgical outcomes and decrease patient complications.

Technology

Hypoxia Inducible Factor (HIF) signaling can increase the generation of new blood vessels and growth of the epithelium, which are important aspects of normal wound healing. However, HIF is quickly degraded by prolyl hydroxylase (PHD). Inhibiting PHD can increase HIF signaling, and therefore promote wound healing. The PHD inhibitor dimethyloxalylglycine, N-(methoxyoxoacetyl)-glycine methyl ester (DMOG) was utilized in an animal model of skin surgery (the McFarlane Flap Model). Animals which received DMOG had less skin necrosis than those which did not receive DMOG, demonstrating the utility of PHD inhibition in skin surgery.

Other applications

PHD inhibitors may be useful in other applications in which HIF signaling may be important, such as:

Anemia

Coronary Artery Disease

Peripheral Vascular Disease

Cancer

Advantages

Improving vascularization of skin flaps would decreases surgical complications, decrease healing time, and improve patient outcomes

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