

INTELLIGENT COOLING FOR SURGICAL BONE DRILLING

This new cooling system improves dental surgery or bone preparation methods (e.g. in orthopedics or brain surgery) by reducing bone damage through overheating. The cooling system adapts to individual cooling requirements depending on the type of surgical procedure, drilling depth etc., by intelligently regulating the amount and path of coolant supply. It is suitable for all state of the art procedures.

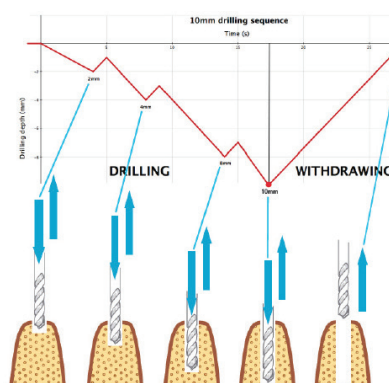
BACKGROUND

In dental bone surgery, a gentle and atraumatic surgical preparation technique is one of the predominant factors for ensuring appropriate bone healing and osseointegration. Overheating of the surrounding bone by the drilling procedure causes unwanted damage. However, irrigation supply by current cooling systems is often inadequate to prevent heat-induced bone necrosis.

TECHNOLOGY

The bone drilling apparatus effectively prevents overheating of the bone tissue by individually adjusting the coolant supply to the heat developed during a procedure. It implements a real-time measurement device, drill

and regulating device for the coolant pumping system. The cooling intensity is varied depending on the drilling depth, time, and device used. Additionally, different cooling methods for various predefined dental applications can be chosen. The methods switch between internal cooling, external cooling and combined cooling, also using different amounts of coolant depending on the heat generated during the individual steps of the procedure.



BENEFITS

- allows atraumatic and new surgical treatment procedures
- preserve healthy bone in surgical drilling preparations
- increases bone apposition during process of osseointegration
- prevents heat-induced bone tissue injuries
- avoids implant failure through tissue necrosis and bone resorptions
- enhances the reliability of dental implants
- ensures sufficient irrigation and permanent cooling liquid supply
- automatical regulation of beneficial type and amount of irrigation method during entire surgical procedure
- ensures mandatory and sufficient irrigation during drilling and withdrawing procedure

REFERENCE:

441.13

AVAILABLE FOR:

- License agreement
- Development partnership

DEVELOPMENT STATUS:

In vitro proof of concept

IPR:

- AT515856 (B1), 2016
- WO2009147492

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