

**Backgrounder**

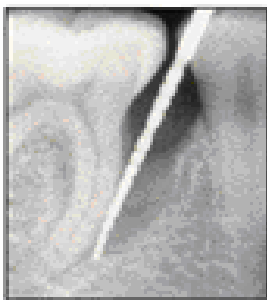


**Straumann Emdogain**

Straumann Emdogain is a well-documented, effective and easy-to-apply gel that supports the predictable re-growth of hard and soft tissues, leading to the regeneration of tooth attachment. Since its introduction in 1996, Emdogain has been used to treat more than one million patients and has been the subject of more than 140 scientific publications.

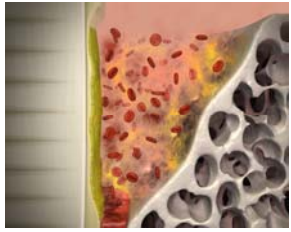
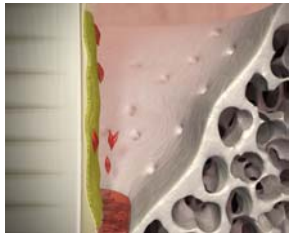
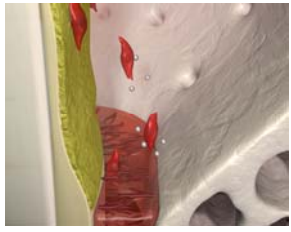


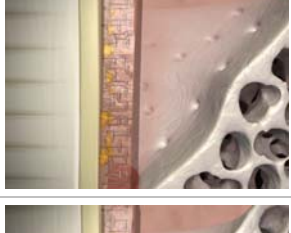

A recent peer-reviewed publication on the product appeared in February. It reported the 5-year results of a long-term study in 82 patients and showed statistically significant increases in tooth attachment after 1 year ( $p < 0.001$ ). Remarkably, tooth attachment increased even further at 5 years ( $p < 0.01$ ) after treatment, endorsing the product's long-term effectiveness in regenerative periodontal surgery<sup>1</sup>.




Notwithstanding, more than 90% of the patients suitable for Emdogain remain untreated, indicating a large unmet clinical need.

**Straumann® Emdogain – Mechanism of action**

|   |  |                              |
|---|--|------------------------------|
|  | <p>In periodontology, “repair” means the formation of long crevicular epithelial cells. In “regeneration” the structure and function of the periodontium are recreated. This means that new cement with new fixated desmodontal fibres must be formed.</p> <p>Straumann® Emdogain regenerates by mimicking the processes of embryonic development.</p> | <p><b>Duration</b></p>       |
|  | <p>After opening a flap and conditioning the root surface with Straumann® PrefGel, Straumann Emdogain is applied to the periodontal defect and distributed evenly thanks to its gel-like consistency.</p>  | <p><i>within seconds</i></p> |
|  | <p>Once applied, the proteins in Straumann Emdogain, the amelogenins, precipitate out within a few seconds and a matrix layer on the root surface is formed.</p>   | <p><i>within seconds</i></p> |

<sup>1</sup>Heden G, Wenström J: Five-year follow-up of regenerative periodontal therapy with enamel matrix derivative at sites with angular bone defects. *J Periodontol* 2006;77:295-301

|   |   |                                   |
|---|---|-----------------------------------|
|    | <p>Once the flap is closed, the periodontal defect fills with a blood coagulum of fibrin and erythrocytes.</p> <p>The coagulum is later replaced by granulation tissue. This tissue serves as the skeletal structure for wound healing and regeneration.</p>                                    | <p><i>within hours</i></p>        |
|    | <p>The matrix layer of Straumann Emdogain then stimulates the attraction and proliferation of mesenchymal cells from the healthy part of the desmodontium.</p>  | <p><i>within days</i></p>         |
|   | <p>The cells secrete specific cytokines and autocrine substances, which promote the necessary proliferation.</p>  | <p><i>within weeks</i></p>        |
|  | <p>Attachment: These conditions provide an optimal environment for supporting cells to settle on the root surface.</p> <p>At this point the supporting cells become differentiated to cementoblasts and begin formation of the cement matrix in which the desmodontal fibres will be fixed.</p> | <p><i>within weeks-months</i></p> |
|  | <p>The new cement layer formed by Straumann Emdogain increases in thickness, extending the desmodontal fibres.</p>  | <p><i>within months</i></p>       |
|  | <p>Meanwhile, the periodontal defect has been filled with newly formed desmodontal tissue.</p>  | <p><i>within months</i></p>       |
|  | <p>In connection with the processes described above, new alveolar bone grows on the root surface and in the defect gap. The desmodontal gap thus achieves its physiological width.</p>  | <p><i>within months</i></p>       |

|   |  |                         |
|---|--|-------------------------|
|  | <p>Straumann Emdogain mimics periodontal development in a unique manner, thereby facilitating recreation of the complex dental structure.</p>                                | <i>within<br/>years</i> |
|  | <p>This means that the tissue required to anchor teeth is regenerated and the periodontal defect is thus functionally closed.</p>  |                         |
|  | <p>Optimised wound healing is advantageous for smooth and rapid regeneration. This can be supported by Straumann Emdogain thanks to its additional antibacterial effect.</p> |                         |