

# The clinical and radiological assessment of periodontal bone loss treatment using Emdogain

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## Abstract

**Admission:** Emdogain is the only one biomaterial using biomimetic effect which is practiced in periodontal surgery.

**Purpose:** The purpose of the study was a clinical and radiological assessment of bone loss treatment using Emdogain.

**Material and methods:** There were 19 persons examined (11 women and 8 men) which have bone loss treated. Initial and monitoring examination after 10 months embraced clinical parameters such as PPD, CAL and radiological – based on intraoral x-ray pictures. Emdogain treatment was made according to surgical procedures.

**Results:** The research has shown reduction of the depth of periodontal pockets average about 3.4 mm and attachment connective tissue growth about 2.2 mm. Bone loss filling was on 67.1% level.

**Discussion:** Bone loss filling and growth of connective tissue attachment are in our research lower than in most of the others publications. Our observation concerned 10 months period so we should expect better effects after longer time.

**Motions:** Emdogain is safe and effective regeneration material.

**Key words:** Emdogain, bone loss, bone regeneration.

## Admission

Nowadays periodontology offers a wide range of biomaterials used for regenerations of destructed by illness periodontal tissues. Only one of them uses biomimetic effect [2]. This is an Emdogain which duplicates a physiological process in embryogenesis of cement, periodontium, alveolar process. This is a substance which contains amelogenin albumen. This preparation creates excellent conditions to selective absorption and migration of the cells periodontium and building a new connective tissue attachment on cleaned up surface of the root. Through that it rebuilds lost periodontal tissues [1,5,7,9,14,15]. Only Emdogain causes formation of the new cellulose with a multiple amount of exogenous fibers. It also protects before formation of endogenous fibers. There are suggestions that Emdogain can cause very advantageous effect after periodontological microsurgical treatment.

## The Aim

The aim of the research was the clinical and radiological assessment of bone loss treatment using Emdogain.

## Material and methods

There were 19 persons examined (11 women and 8 men) in 29-34 year old age. They were general sound and non smokers. There were found 42 interproximal cavities (28 3-wall and 14 2-wall) which were assessed during operations.

Clinical and radiological review was carried before treatment and after 10 months. In clinical examination teeth mobility, depth of periodontal pockets (PPD in mm), level of clinical attachment (CAL in mm) was considered. Destruction level of dental process was estimated according to intraoral x-ray pictures (linear measurement of the depth and width of bone loss). In the initial phase of the treatment oral cavity hygiene training

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**Table 1.** The average clinical parameters values PPD, CAL before and after 10 months from microsurgical periodontal treatment

	PPD (mm)	CAL (mm)
Before treatment	8.5	10.4
10 months after treatment	5.1	8.2
Improvement	3.4	2.2

was carried out. Calculus was removed and root planning was made. At the end bite correction was carried out. Mobile teeth were splinted by Fibre-Kor splinting. Surgical treatment was carried out in local anesthesia. After the cuts in periodontal pockets were made muco-gingival flap was exposed (at the vestibular, lingual or palatal side). The vertical cuts was made only there where it was necessary to allow better access or better wound closing. The granular structure was removed, scaling and smooth of the root was made. The operation field was rinsed with 0.9% NaCl. After mechanical preparation of the root surface Emdogain was carried in starting from apical part. The muco-periosteal flap was repositioned to the crown side and sutured with non-reabsorbable suture according to producer directions. After 2 or 3 weeks sticks were removed. The patients were recommended to: rinse oral cavity with 0.2% chlorhexidine solution, use antibiotics for 7 days and monitoring visits with professional teeth cleaning.

## Results

In *Tab. 1* average clinical parameters values at the beginning and after 10 months from microsurgical periodontological treatment was shown. Average depth of the periodontal pockets was 8.5 mm and loss of the connective tissue attachment average about 2.2 mm was found. Rebuilding of bone of alveolar process was the effect of the treatment too (*Tab. 2*). The level of the bone estimated by x-ray pictures grew during 10 months average about 3.1 mm depth and 1.5 mm width of bone loss. Defect filling percentage is about 67.1%.

## Discussion

Surgical treatment using biomaterials is an important part of comprehensive periodontal diseases cure. Results of the own research shows an advisability of using minor surgery regeneration. It causes a significant improvement of the clinical and radiological indexes. Our results are similar to the other authors [1-16]. Among our patients average starting values such as PPD and CAL were higher so the status of the patients was more advanced (about 1.5-2.5 mm) from those which other researchers have noted [3,4,6-8,10-13,16].

Shallow of the periodontal pockets which we achieved was similar to the other authors and was about 2.9-3.6 mm [4,6,7]. Most of the reviews concern much bigger reduction of the

**Table 2.** The average values of radiological index before and after months from microsurgical periodontal treatment

	depth of bone loss (mm)	width of bone loss (mm)
Before treatment	7.8	3.3
10 months after treatment	4.7	1.8
Bone growth	3.1	1.5
Defect filling percentage	67.1%	

depth of periodontal pockets (4.0 to 4.7 mm) [3,8,10,12,13,16]. Rebuilding of the connective tissue attachment which we found was lower average about 2.2 mm from most of reviews [3,8,10,12,13,16]. They concerned average values from 3.0 to 4.2 mm. Only a few researchers noted values similar to ours [4,6,7]. We should remember that CAL and PPD values are obtained faster than the rebuilding of the bone and the noted parameters during examination do not recognize the tissues but only give the picture of their resistance for pressure growth. That's why we need x-ray examination. After 10 months we noticed bone rebuilding with 67.1% cavity filling. This results are similar to those the other authors show. Parashis et al. [8] noted 61%, Heden [3] and Heil et al. [4] 70%. Using albumen of enamel is a great method of stimulation destructed periodontal pockets regeneration. We should expect that longer observation period will give better clinical parameters values.

## Motions

Emdogain – albumen of enamel matrix is easy in use, safe and effective method to rebuilding of destructed periodontal structures.

## References

1. Aranjó M. Gojenie się uszkodzenia w okolicy rozwidlenia korzenia po zastosowaniu GTR z Emdogainem i bez Emdogainu. *Stomat Współcz*, 1999; 6: 14-7.
2. Gestrelus S, Lyngstadaas C. Periodontal regeneration based on biomimicry. *Clin Oral Invest*, 2000; 4: 120-5.
3. Heden G. A case report study of 72 consecutive Emdogain – treated intrabony periodontal defects: clinical and radiographic findings after 1 year. *Int J Periodont Restorative Dent*, 2000; 20: 127-39.
4. Heijl L, Heden G, Svardstrom G, et al. Enamel matrix derivative (Emdogain) in the treatment of intrabony periodontal defects. *J Clin Periodont*, 1997; 24: 705-14.
5. Hirooka H. Biologiczna koncepcja zastosowania białka matrycy szkliwa: prawidłowa regeneracja przyzębia. *Quinn*, 1999; 7: 117-27.
6. Laskus-Perendyk A, Górská R. Zastosowanie preparatu Emdogain w leczeniu chirurgicznym przyzębia. *Stomat Współcz*, 1998; 5: 393-7.
7. Laskus-Perendyk A, Górská R, Zaremba M, et al. Emdogain w leczeniu chirurgicznym chorób przyzębia. *Nowa Stoma*, 2000; 5(4): 40-5.
8. Parashis A, Tsiklakis K. Clinical and radiographic findings following application of enamel matrix derivative in the treatment of intrabony defects. *J Clin Periodont*, 2000; 5(27): 705-13.
9. Parodi R, Liuzzo G, Patrucco P, et al. Use of Emdogain in the treatment of deep intrabony defects: 12-month clinical results. *Histologic and radiographic evaluation*. *Int Periodont Restorative Dent*, 2000; 20: 585-95.
10. Sculean A. Treatment of intrabony periodontal defects with an

enamel matrix protein derivative (Emdogain): a report of 32 cases. *Int J Periodont Restorative Dent*, 1999; 19: 157-63.

11. Sculean A, Chiantella G, Windish P, et al. Kliniczna i histologiczna ocena wyniku leczenia ubytków przyzębnych preparatem Emdogain. *Quint Periodontol Implant*, 2001; 1: 37-42.

12. Sculean A, Windish P, Chiantella G, et al. Treatment of intrabony defects with enamel matrix protein and guided tissue regeneration. *J Periodontol*, 2001; 71: 705-14.

13. Stuart J. A comparative study utilizing open flap debridement with and without enamel matrix derivative in the treatment of periodontal intrabony defects: a 12-month re-entry study. *J Periodontol*, 2001; 71: 25-34.

14. Tokajuk G, Pawińska M. Leczenie zespołu perio-endo z zastosowaniem różnych biomateriałów. *Ann Acad Med Silesiens*, 2000; 31: 285-91.

15. Tokajuk G, Pawińska M. Odległa ocena kliniczno-radiologiczna leczenia defektów kostnych w zespole przyzębno-endodontycznym z użyciem różnych technik regeneracyjnych. *Dent Med Probl*, 2002; 39(1): 103-7.

16. Zetterstrom O, Andersson C, Ericsson L, et al. Clinical safety of enamel matrix derivative (Emdogain) in the treatment of periodontal defects. *J Clin Periodontol*, 1997; 24: 697-704.