International Poster Journal IPJ of Dentistry and Oral Medicine

Int Poster J Dent Oral Med 2000, Vol 2 No 4, Poster 56

Risks and complications in membrane guided bone regeneration - a retrospective analysis

Language: English

Author: Frank Peter Strietzel
Universitätsklinikum Charité, Zentrum für Zahnmedizin, Abteilung für Oralchirurgie und zahnärztliche Röntgenologie, Germany

Date/Event/Venue:
01.06.2000-03.06.2000
51. Jahrestagung der AG Kieferchirurgie bei der Deutschen Gesellschaft für Zahn-, Mund- und Kieferheilkunde
Bad Homburg v. d. H.

Introduction

The method of guided bone regeneration (GBR) has made it possible to place endosseous implants in unfavourable anatomic conditions. GBR is a clinically and evidence based method (1,2). Expanded polytertafluoroethylene (ePTFE) as a non- resorbable material is widely used. Premature membrane exposures may put the treatment success at risk (3-5).

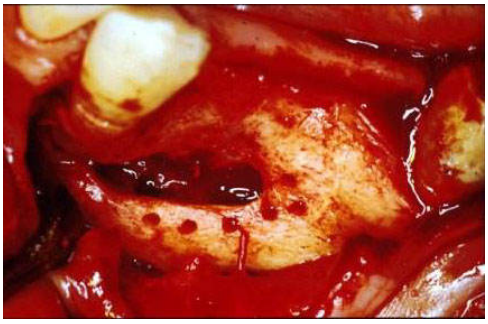


Figure 1: Defect in region 34, 35 prepared for GBR by means of autogenous bone chips and a GoreTex membrane.

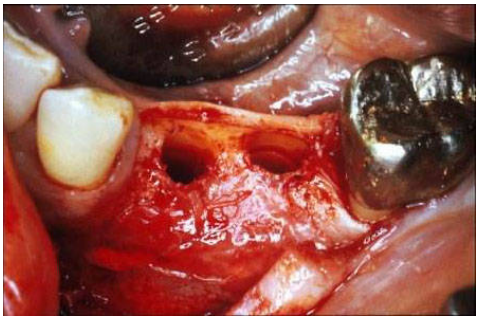


Figure 2: The same site 4 months later: the membrane was removed and the implant bed preparation is just finished.

Objective

It was the aim of this study to ascertain the amount of premature membrane exposures and to investigate possible reasons.

Material and Methods

Retrospective investigation of the treatment course in 72 patients undergoing GBR; data capture between 03/1993 and 02/2000 (44 female and 28 male patients, median of age 38,5 years [min. 18 y., max. 68 y.]). Using GoreTex augmentation material (ePTFE) (W.L.Gore & assoc., Flagstaff, Arizona/USA) for GBR, membrane fixation by means of titanium pins (Frios-membrane pins, Friadent, Mannheim, Germany) or cover screw. Statistical analysis by cross tables, calculation of the Spearman correlation coefficient.

Parameter	Group 1	Group 2
Membrane covering the alveolar ridge	78 %	97 %
Membrane below the incision line	44 %	72 %
Smoker	15 %	25 %
Space maintaining defect	22 %	12 %

Table 1: Distribution of frequencies of the parameters investigated in group 1 (all included patients, n = 72) and group 2 (patients who revealed premature membrane exposures, n = 32)

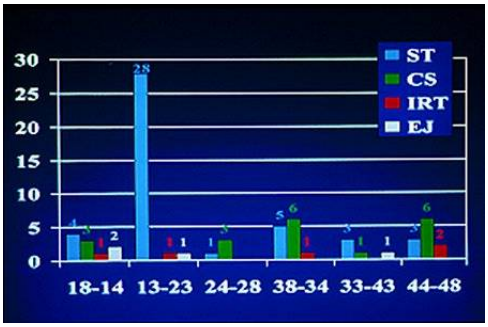


Figure 3: Topographic distribution of frequencies of indication groups (partial edentulism: ST = single tooth replacement, CS = cantilever situation, IRT = interrupted row of teeth; complete edentulism: EJ = edentulous jaw) concerning the sextants (regions 18-14, 13-23, 24-28, 38-34, 33-43, 44-48)

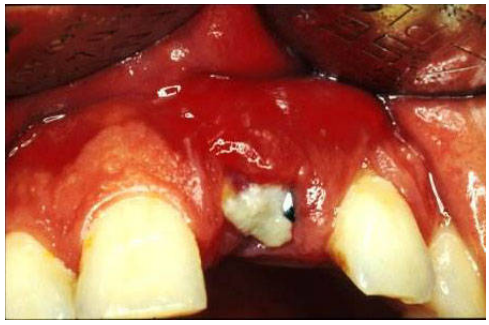


Figure 4: Premature partial membrane exposure and periimplant mucositis in region 22 (GoreTex membrane, 1 titanium pin exposed).

Results

-44 % premature membrane exposures (n=32), 14 patients uncontrolled, loss of 2 implants. -28 % of premature membrane exposures revealed between the 1st and 14th postoperative days, 72 % revealed after uneventful primary wound healing after the 21st postoperative day -Significant correlations (Spearman) between the parameter "premature membrane exposure" and the parameters "membrane below the incision line" (r=0,42, p=0,0003), "membrane covering the alveolar ridge"(r=0,41, p=0,0005) and "smoker" (r=0,24, p=0,041). -Tendency of correlation between the parameter "premature membrane exposure" and the parameters "defect configuration" (r=0,21, p=0,078). -No correlation concerning the parameters "type of temporary denture", "augmentation material below the membrane", "gender", "indication group".

Discussion and Conclusions

The application of the non-resorbable material ePTFE (GoreTex®) should be critically weighed up concerning the choice of incision line and the flap design respectively as well as the defect morphology, smoking habits and the size and site of the membrane covered defect. Alternative methods should be taken into account

Bibliography

1. Becker W, Dahlin C, Becker BE, Lekholm U, van Steenberghe D, Higuchi K, Kultje C: The use of e-PTFE barrier membranes for bone promotion around titanium implants placed into extraction sockets: a prospective multicenter study. Int J Oral Maxillofac Implants 1994, 9: 31-40.
2. Dahlin C, Andersson I, Linde A: Bone augmentation at fenestrated implants by an osteopromotive membrane technique. A controlled clinical study. Clin Oral Impl Res 1991, 2: 159-165.
3. Köhler S, Schmelzle R, Donath K: Die gesteuerte periimplantäre Geweberegeneration mit der Goretex-Membran. Dtsch Z Mund Kiefer GesichtsChir 1993, 17: 88-92.
4. Lorenzoni M, Pertl C, Keil C, Wegscheider WA: Treatment of peri-implant defects with guided bone regeneration: a comparative clinical study with various membranes and bone grafts. Int J Oral Maxillofac Implants 1998, 13: 639-646.
5. Nowzari H, Slots J: Microbiologic and clinical study of polytetrafluoroethylene membranes for guided bone regeneration around implants. Int J Oral Maxillofac Implants 1995, 10: 67-73.

Abbreviations

GBR guided bone regeneration ePTFE expanded polytetrafluoroethylene r correlation coefficient p niveau of significance

This Poster was submitted on 07.11.00 by OA Dr. Frank Strietzel.

Correspondence address:
OA Dr. Frank Strietzel
Universitätsklinikum Charité, Zentrum für Zahnmedizin, Abteilung für Oralchirurgie und zahnärztliche Röntgenologie
Augustenburger Platz 1
13353 Berlin
Tel.: 450-62609

Poster Faksimile:

Risks and complications in membrane guided bone regeneration – a retrospective analysis

F.P.Strietzel
Universitätsklinikum Charitè, Medical Faculty of the Humboldt-Universität of Berlin, Dental School, Department of Oral Surgery and Dental Radiology (Head: Prof.Dr.P.A. Reichart)

Introduction

The method of membrane guided bone regeneration (GBR) has made it possible to place endosseous implants in unfavourable anatomic conditions. GBR is a clinically and evidence based method[1,2,3].
Expanded polytetrafluorethylene (ePTFE) as a non-resorbable material is widely used.
Premature membrane exposures may put the treatment success at risk [3-9]. It was the aim of this study to ascertain the amount of premature membrane exposures and to investigate possible reasons.

Materials and Methods

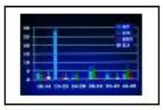
- Retrospective investigation of the treatment course in 72 patientens undergoing GBR; data capture between 03/1993 and 02/2000 (44 female, 28 male patients, median of age 38,5 years [min. 18 y., max. 68 y.]).

- Using GoreTex® augmentation material (ePTFE) (W.L.Gore & Assoc., Flagstaff, Arizona/USA) for GBR, membrane fixation by means of titanium pins (Frios®-membrane pins, Friadent, Mannheim, Germany) or cover screw.

- Statistical analysis by cross tables, calculation of the *Spearman* correlation coefficient.

Table 1 Distribution of frequencies of the parameters investigated in group 1 (all included patients, n= 72) and group 2 (patients with recorded premature membrane exposures, n= 32)

Parameter	Group 1	Group 2
Membrane covering the alveolar ridge	76 %	97 %
Membrane below the incision line	44 %	72 %
Smoker	15 %	25 %
Space maintaining device	22 %	12 %



Results

- 44 % premature membrane exposures (n=32), 14 patients uncontrolled, loss of 2 implants.
- 28 % of premature membrane exposures revealed between the 1st and 14th postoperative days, 72 % revealed after uneventful primary wound healing after the 21st postoperative day
- Significant correlations (*Spearman*) between the parameter „premature membrane exposure" and the parameters „membrane below the incision line" (r=0,42, p=0,0003), „membrane covering the alveolar ridge" (r=0,41, p=0,0005) and „smoker" (r=0,24, p=0,041).
- Tendency of correlation between the parameter „premature membrane exposure" and the parameters „defect configuration" (r=0,21, p=0,078).
- No correlation concerning the parameters „type of temporary denture", „augmentation material below the membrane", „gender", „indication group".

Conclusions

The application of the non-resorbable material ePTFE (GoreTex®) should be critically weighed up concerning the choice of incision line and the flap design respectively as well as the defect morphology, smoking habits and the size and site of the membrane covered defect. Alternative methods should be taken into account.

Literature: