A retrospective analysis of bone level changes around dental implants with a chemically modified, hydrophillic surface after three years in function

1490

S. Shahdad[1], M. Patel[1*], M, Siddiqui[1], V. Agarwal[1], L. Zhang[1,2], A. Petrie[4], M. Bornstein[3]

[1] Restorative Dentistry, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, UK, [2] Dept. of Implant Dentistry, West China School and Hospital of Stomatology, Sichuan University, Chengdu, China, [3] UCL Eastman Dental Institute, London, UK , [4] Oral and Maxillofacial Radiology, Applied Oral Sciences, Faculty of Dentistry, The University of Hong Kong, Hong Kong SAR, China

Introduction

- Osseointegration refers to a direct structural and functional connection between ordered, living bone and the surface of a load-carrying implant
- Rate of osseointegration and development of secondary stability is affected by surface topography and chemistry of the implant
- SLActive surfaces are produced by chemical modification after grit blasting and acid etching. This allows increased bone to implant contact in the initial phases of healing, enhanced platelet activation and chemokine release and rapid osseointegration
- Peri-implant bone loss is a key measure of implant success. According to new criterion, successful implant should have minimal or no progressive bone loss on serial radiographs

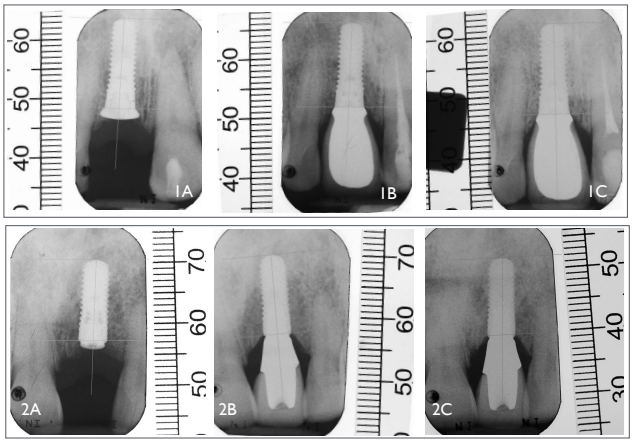
Aims

- To assess the bone level changes around SLActive implants after 3 years in patients treated at university teaching hospital and Specialist practice
- To assess the affect of influential factors such as smoking history, implant type (Bone level or Tissue level) and position, placement protocol, surgical technique and clinical setting on bone levels

Methodology

- Sample:
  Clinical records of dental implants placed between 2006 and 2014 in University Hospital and Specialist Practice were obtained after Ethical approval.
- Inclusion Criteria:
  18 years of age
  Received at least one dental implant with a modified SLA surface (SLActive; Institut Straumann AG, Basel, Switzerland).
  Radiographs taken at fit of the final prosthesis (Baseline), 1-year and 3-years following fit of the final restoration.
- Data collection
  Baseline (Fit of definitive restoration), 1 year and 3 year follow up radiographs were extracted from the clinical records
- Measurements:
  Implant abutment junction (IAJ) and first bone to implant contact (BIC) were identified and marked on both digitised and digital radiographs (Figure 1 and 2).

  2 operators used Image J software to measure bone loss on mesial and distal aspects from IAJ to BIC after correction of magnification error.

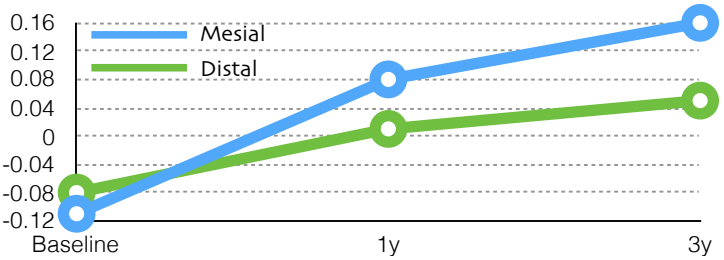


Figures: Tissue Level (1) and Bone Level (2) implant design measurements using ImageJ software. A) Baseline radiograph, B) 1y, C) 3y

Results

- 59 patients (27 (46%) male, 32 (54%) female; mean age of 48.6 years (SD 15.8)) with a total of 114 implants inserted were included for the present analysis.
- The mean (SD) BIC

Baseline:	mesial: -0.11mm (0.72)	distal:-0.08mm (0.72)
1y:	mesial: 0.08mm (0.82)	distal: 0.01mm (0.83)
3y:	mesial: 0.16mm (0.78)	distal: 0.05mm (0.82)



- Mean bone loss of 0.21 mm (95%CI 0.09 to 0.33mm, p = 0.001) for the mean mesial and distal values was noted after 3y
- Inter-rater agreement: Correlation coefficient = 0.998 and 1.00
- None of the potential influential factors had a statistically significant effect (p > 0.05).

Conclusions:

- Within the limitations of the present study, dental implants with a chemically modified, hydrophilic surface exhibit minimal changes of the bone levels after 3 years in function regardless of implant type and site, placement protocol, clinical setting, smoking and surgical technique.

References

List of references available on request.
Please email: mital.patel2@bartshealth.nhs.uk

Barts Health NHS
NHS Trust

Barts and The London
School of Medicine and Dentistry