

Abstracts

from publications in Peer Reviewed Journals

The following is a list of articles with excerpts from PubMed that are relevant to Southern Implants. PubMed is a service of the National Library of Medicine that includes over 16 million citations from MEDLINE and other life science journals for biomedical articles dating back to the 1950's. Our implants have always been identical to those distributed by Southern Implants in other parts of the world.

Tawse-Smith, A., Payne, A.G.T., Kumara, R., Thomson, W.M. One-stage operative procedure using two different implant systems: A prospective study on implant overdentures in the edentulous mandible. Clin Implant Dent Relat Res 2001; 3-4; 185-193.

BACKGROUND: Evidence-based reports are needed to support the application of a one-stage surgical protocol for unsplinted implants supporting mandibular overdentures.

PURPOSE: To examine the feasibility and success of using two different dental implant systems (originally designed for two-stage operative technique) using a one-stage operative procedure in patients being rehabilitated with implant supported mandibular overdentures.

MATERIALS AND METHODS: The study sample involved 24 edentulous subjects (aged 55-80 yr) randomly allocated to two different implant systems, one with a machined titanium implant surface (Steri-Oss/Nobel Biocare, Goteborg, Sweden) and the other with a roughened titanium surface (Southern Implants, Ltd., Irene, South Africa). Two unsplinted implants to support implant overdentures were placed in the anterior mandible of all patients, using a standardized one-stage surgical and prosthodontic procedure. Primary stability and bicortical anchorage of the implants was mandatory before healing abutments were connected at the time of implant placement. Implant overdentures and their respective matrices were inserted following a standard 12-week healing period. Data relating to mobility tests, radiographs, and peri-implant parameters were documented at 12, 16, and 52 weeks after surgery.

RESULTS: A success rate of 95.8% for the Steri-Oss and 100% for the Southern Implants was found, without any statistically significant differences in the marginal bone loss. Significant changes in Periotest values were observed for both types between 12 and 52 weeks ($p < .001$). Minor changes were observed in the peri-implant parameters evaluated.

CONCLUSIONS: These preliminary findings show a successful application of this one-stage approach for unsplinted implants supporting mandibular overdentures with Steri-Oss and Southern Implant Systems.

Tawse-Smith, A., Payne, A.G.T., Kumara, R., Thomson, W.M. Early loading of unsplinted implants supporting mandibular overdentures using a one-stage operative procedure with two different implant systems: A 2-year report. Clin Implant Dent Relat Res 2002; 4: 33-42.

This article is a 2 year follow-up on the above article.

BACKGROUND: Step-wise reduction in loading protocols is necessary to evaluate early loading of implants with mandibular overdentures.

PURPOSE: To compare the success rates of two different dental implant systems following conventional or early loading protocols in patients being rehabilitated with mandibular overdentures.

RESULTS: There was no statistically significant difference in the success rates of the two systems in either control or test groups. At the 2-year evaluation, a success rate was found of 87.5% and 70.8% for the control and test Steri-Oss groups, respectively, and 83.3% and 100% for the control and test Southern Implants groups were observed. For the Steri-Oss groups, eight implants were lost at an early stage: seven in the test group and one in the control group. For the Southern Implants control and test groups, no failures were seen at any time interval. There were no significant differences in marginal bone loss, Periotest values, and peri-implant parameters between implant systems or between any of the control or test groups.

CONCLUSIONS: Early loading, with step-wise reductions in loading protocols, of unsplinted machined Steri-Oss and roughened Southern Implants fixtures with mandibular overdentures is possible for up to 2 years.

Boyes-Varley, J.G., Lownie, J.F., Howes D.G., Blackbeard G.A. Surgical modifications to the Branemark Zygomaticus Protocol in the treatment of the severely resorbed maxilla: a clinical report. Int J Oral Maxillo Facial Implants 2003

PURPOSE: The Zygomaticus dental implant, designed by Nobel BioCare, was developed for the treatment of the severely resorbed maxilla. Branemark has reported an overall success rate of 97.6% with the placement of 183 implants over the last 12 years. The purpose of this article was to present a modification to the original Branemark surgical approach to achieve better access and optimal implant placement.

MATERIALS AND METHODS: There are parameters within the patient's resorbed skeletal frame that guide the surgical placement of the currently used implant however, there are shortcomings in the current surgical protocol. This report describes a simplified surgical approach in 45 patients (77 implants) using an implant with a modified head angulation of 55 degrees and a placement appliance to assist the surgeon in placing the implant as close to the crest of the edentulous ridge as possible.

RESULTS: The placement appliance identifies accurately the anatomic constraints of the resorbed skeletal frame that limit implant placement. This, together with the modified surgical protocol, has resulted in improved access and in ideal positioning of the restorative head.

DISCUSSION: The present technique allows restorative clinicians to achieve a more ideal restorative result in the posterior maxillary alveolus using the zygomatic implant, while reducing the buccal cantilever, improving tongue space, and access for maintenance.

CONCLUSION: By placing the implant closer to the crest of the alveolar ridge using the placement appliance and an implant with a 55-degree head, the emergence of the restorative head and resultant buccal cantilever can be reduced by as much as 20%.

Nikellis, I., Levi, A., Nicolopoulos, C. Immediate loading of 190 endosseous dental implants: a prospective observational study of 40 patient treatments with up to 2-year data. Int J Oral Maxillofac Implants. 2004 Jan-Feb; 19(1):116-23.

PURPOSE: The present study was undertaken to determine the feasibility of using primary stability as a predictor of implant success in patients whose implants were immediately loaded.

MATERIALS AND METHODS: The study included 40 patients, in whom a total of 190 Southern implants were placed, 102 in maxillary sites and 88 in mandibular sites. All were loaded within 72 hours of placement. Sixteen patients were completely edentulous in the mandible and/or the maxilla. The remaining 24, who were partially edentulous, received fixed partial dentures or single-implant restorations. All of the definitive implant restorations were screw retained. The criterion for loading was clinical judgment of primary stability, verified by a «screw test.» Impressions were made after implant placement to facilitate the fabrication of a laboratory-made heat-processed provisional restoration from acrylic resin. Following a 4-month period for osseointegration and soft tissue healing, definitive fixed prostheses were fabricated.

RESULTS: There were no surgical complications. After 1 to 2 years, all 190 implants had survived and were considered 100% successful, as determined by independent testing of mobility and radiographic evidence of osseointegration. In 4 patients, fracture of the provisional restoration occurred during the healing period.

DISCUSSION: Clinical research has shown that immediate loading is a viable treatment modality. The favorable success rate reported in this study for rough-surfaced implants suggests that adherence to a protocol, an important parameter of which is primary stability above 32 Ncm, can lead to osseointegration.

CONCLUSION: The results of this limited investigation suggest that patients who are partially or completely edentulous may be immediately restored with implants and fixed provisional restorations, provided that the dental implants are adequately stable immediately after their surgical placement. This alternative therapeutic approach did not appear to affect the up-to-2-year survival of the implants in this patient population.

Dellow, A.G., Driessen, C.H., Nel, H.J.C. Scanning Electron Microscopy evaluation of the interfacial fit of interchanged components of four dental implant systems. Int J of Prosthodont 1997 10; 216-221.

The introduction of the original Swedish implant system (Branemark) was followed by several alternative implant systems with implants and components that closely resembled the original design and treatment protocol. Some of these alternative systems may be interchangeable. Manufacturing variations can result in as much as 0.1 mm of space between the component parts. The implant/abutment interface fit was evaluated by scanning electron micrography for each of four implant systems, as well as interchanged components between the various systems. Results showed that certain implant system abutments are interchangeable and that the accuracy of fit meets with or exceeds the criteria set by the original Swedish system.

Payne, AG, Tawse-Smith, A, Thompson, WM, Kumara, R. Early functional loading of unsplinted roughened surface implants with mandibular overdentures 2 weeks after surgery. Clin Implant Dent Relat Res. 2003; 5 (3):143-53. PMID: 14575630

BACKGROUND: Before early functional loading of unsplinted implants with mandibular overdentures can become widespread, more clinical studies are needed to investigate the success of the approach.

PURPOSE: To evaluate the success rates of two types of roughened titanium surface implants with early 2-week functional loading of paired mandibular interforaminal implants with overdentures.

MATERIALS AND METHODS: Random allocation divided 24 strictly selected edentulous participants into two groups, with each group to receive a different implant system (ITI Dental Implant System, Straumann AG, Walden- burg, Switzerland; or Southern Implant System, Southern Implants, Irene, South Africa). Two implants were placed in the anterior mandible of all participants using one-stage standardized surgical procedures. Previously constructed conventional mandibular dentures (opposing maxillary complete dentures) were

temporarily relined and worn by the participants for the first 2 weeks; participants used a soft diet. Two weeks after implant surgery and following some mucosal healing, the mandibular dentures had the tissue conditioner removed and the appropriate matrices included for an unsplinted prosthodontic design.

RESULTS: No implant from either group was lost. Resonance frequency analysis (RFA) indicated higher primary stability at surgery for the Southern group than for the ITI group, with a statistically significant difference between the groups throughout the study period. The drop in RF values between surgery and 6 weeks was significant and was greater for the Southern group. RFA also indicated stabilized osseointegration between 6 to 12 and 12 to 52 weeks, with no participant showing any decrease in those values over time. Participants with type 3 bone showed a significant improvement in RF values between 12 and 52 weeks, eventually matching those of participants with type 2 bone. There were no significant differences in marginal bone loss, periimplant parameters, or prosthodontic maintenance between the groups over the study period.

CONCLUSIONS: Using only strict patient selection criteria, 1-year follow-up data indicate that early functional loading of ITI and Southern implants with mandibular two-implant overdentures is possible as early as 2 weeks after implant surgery.

Howes, D.G., Boyes-Varley, J.G., Lownie, J.F., The Zygomatic Implant Protocol in the treatment of the severely resorbed maxilla. SADI 2003; 58:3; 106-114

The zygomaticus dental implant, designed by Nobel BioCare, was developed primarily for the treatment of the severely resorbed maxilla. Branemark has reported an overall success rate of 97.6% with the placement of over 200 zygomatic implants during the period 1989 to 2001. There are well-defined characteristics within the patient's resorbed skeletal frame which guide the surgical placement of the zygomatic implant, thus determining whether the surgeon should use an implant with a 45° or 55° angulated head. This allows implant-supported restoration of the resorbed maxilla with a fixed cross arch prosthesis in the maxilla without a bone graft to the posterior maxilla. The use of a modified head angulation of 55°, with implant placement as close to the crest of the edentulous ridge as possible, allows restorative clinicians to achieve an ideal restorative position in the posterior maxilla. The use of a zygomatic implant with a 55° head reduces the buccal cantilever by 20%.

Watson.G.K., Payne, A.G.T., Purton, D.G., Thomson W.M. Mandibular overdentures: Comparative evaluation of prosthodontic maintenance of three different implant systems during the first year of service Int J Prosthodont 2002; 15: 259-266.

PURPOSE: The purpose of this study was to evaluate the professional time required for the prosthodontic maintenance events of mandibular implant overdentures during the first year of service using three different implant systems (ITI, Steri-Oss, or Southern).

MATERIALS AND METHODS: Seventy-two mandibular implant overdenture patients were allocated to three equal groups, each treated with a different implant system. Data on prosthodontic maintenance events during the first year were categorized and analyzed according to professional time allocation per procedure.

RESULTS: Sixty-eight percent of the patients, regardless of implant system, required prosthodontic maintenance in the first year, most commonly for the matrices. The Southern Implants matrices required less maintenance than those of Steri-Oss or ITI ($P < .05$). Additional overdenture maintenance was required by 28% of patients, irrespective of implant system. When all categories of prosthodontic maintenance were combined, there were no differences between implant groups. Evaluation of overall prosthodontic success using six-field tables revealed

statistically significant differences between the three implant systems, with more ITI and Steri-Oss patients than Southern Implants patients requiring overdenture retreatment (repair).

CONCLUSION: During the first year of service, the matrix maintenance requirements of Southern Implants were significantly lower than those of the ITI or Steri-Oss groups; this was reflected in the number of retreatment (repair) categories recorded. Although the three systems did not differ significantly for overall prosthodontic maintenance, both the Steri-Oss and the ITI titanium matrices showed problems of clinical significance.

Daly P.F., Pitsillis, A., Nicolopoulos, C., Occlusal reconstruction of a collapsed bite by orthodontic treatment, pre-prosthetic surgery and implant supported prostheses: A case report. SADJ 2001; 56-6; 278-282.

The loss of mandibular molars can result in a collapsed bite owing to tilting of teeth adjacent to the gap and overeruption of maxillary molar segments. The lost interarch and interdental space must be regained before prosthetic reconstruction. This case report documents the treatment of a patient by orthodontic, surgical and prosthetic means. The teeth were orthodontically aligned to meet predetermined surgical and prosthetic requirements. The surgical phase comprised a posterior segmental maxillary osteotomy and one-stage placement of three large-diameter implants in the mandible. Finally, the occlusion was restored with mandibular implant-supported prostheses.

Payne, A.G., Tawse-Smith, A., Thomson, W.M., Duncan, W.D., Kumara, R. One-stage surgery and early loading of three implants for maxillary overdentures: a 1-year report. Clin Implant Dent Relat Res. 2004; 6(2):61-74.

This article uses the 3.25mm diameter implant under extremely demanding conditions.

BACKGROUND: Maxillary implant overdentures opposing mandibular two-implant overdentures are an underused treatment option for edentulous patients. Fewer implants, simple surgery, and short healing periods may increase patients' acceptance of this treatment concept.

PURPOSE: To determine implant success, after overdenture loading, of three narrow-diameter roughened-surface implants placed in edentulous maxillas, using a one-stage surgical procedure, a 12-week healing period, and opposing mandibular two-implant overdentures.

MATERIALS AND METHODS: Forty edentulous participants with mandibular two-implant overdentures were allocated to two groups with similar implant systems. Each group had three narrow-diameter roughened-surface implants placed into their edentulous maxillas in a one-stage surgical procedure. Standardized intraoral radiography and implant stability tests were performed sequentially at surgery, at 12 weeks (prior to loading), and at 64 weeks (after 1 year of loading with maxillary overdentures).

RESULTS: One hundred seventeen implants were placed in 39 participants. After 1 year of loading, 15 implants had failed in 11 patients, 4 implants have been put to sleep in 3 patients, and 1 patient has died. Data on marginal bone loss and resonance frequency analysis showed no significant differences between the implant systems. The mean marginal bone loss was 1.30 mm (+/- 0.44 mm) from surgery to 12 weeks and 0.32 mm (+/- 0.48 mm) between 12 and 64 weeks with loading. The mean implant stability quotient and resonance frequency values showed a statistically significant improvement over time, at 56.05 (5,891 Hz), 57.54 (5,981 Hz), and 60.88 (6,167 Hz) at surgery, 12 weeks, and 64 weeks, respectively. The overall success rate for all implants combined was 81%, and the cumulative survival rate was 84.61%.

CONCLUSION: In patients with mandibular two-implant overdentures, three narrow-diameter roughened-surface implants can be placed in the edentulous maxilla, using a one-stage surgical procedure, and can be loaded within 12 weeks with overdentures for 1 year.

Esposito M., Grusovin, M.G., Coulthard, P., Thomsen, P., Worthington, H.V. A 5-year follow-up comparative analysis of the efficacy of various osseointegrated dental implant systems: a systematic review of randomized controlled clinical trials. Int J Oral Maxillofac Implants. 2005 Jul-Aug;20(4):557-68.

PURPOSE: To test the null hypothesis that there is no difference in failure rates between various root-formed osseointegrated dental implant systems after 5 years of loading.

MATERIALS AND METHODS: A search was conducted for all randomized controlled clinical trials (RCTs) comparing different implant systems with a follow-up of 5 years. The Cochrane Oral Health Group's Trials Register, CENTRAL, MEDLINE, and EMBASE were searched. Several dental journals were also searched by hand. Written contacts were established with authors of the identified RCTs and with more than 55 oral implant manufacturers and personal contacts to identify unpublished RCTs. No language restriction was applied. The last electronic search was conducted on February 1, 2005. Screening of eligible studies, quality assessment, and data extraction were conducted in duplicate. Results were expressed as random effect models using weighted mean differences for continuous outcomes and relative risk for dichotomous outcomes with 95% confidence intervals.

RESULTS: Ten RCTs were identified. Four of these RCTs, reporting results from a total of 204 patients, were considered suitable for inclusion. Six different implant types were compared. On a per-patient rather than a per-implant basis, there were no statistically significant differences, with the exception of more marginal bone loss around early loaded Southern implants when compared to early loaded Steri-Oss implants (mean difference - 0.35 mm; 95% CI -0.70 to -0.01). However, the difference disappeared in the meta-analysis.

DISCUSSION AND CONCLUSIONS: There were no clinical differences among implant systems. However, these findings are based on only 4 RCTs with few participants. More RCTs should be conducted with larger patient samples.

Hall J.A., Payne A.G., Purton D.G., Torr B., A randomized controlled clinical trial of conventional and immediately loaded tapered implants with screw-retained crowns. Int. Journal of Prosthodontics 2006 Jan-Feb;19(1):17-9.

PURPOSE: Surgical, prosthodontic, and esthetic outcomes of conventional and immediately loaded, single, tapered, roughened-surface Southern implants in the anterior maxilla that were restored with screw-retained crowns were compared over 1 year.

MATERIALS AND METHODS: Standardized surgical and prosthodontic procedures were followed and accepted criteria were used for assessment.

RESULTS: There were no significant differences within or between the control and test groups for age, gender, bone quality or quantity, implant stability measurements at surgery, or implant length.

CONCLUSION: After 1 year, the implants that had been immediately loaded with single provisional crowns at surgery and definitive crowns 8 weeks later were as successful as conventionally loaded 2-stage implants. 14 out of 14 implants in the delayed loaded group survived and 13 out of 14 in the immediately loaded group survived.

Hall J.A., Payne A.G., Purton D.G., Torr B, Duncan W.J., De Silva R.K., Immediately restored, single-tapered implants in the anterior maxilla: prosthodontic and aesthetic outcomes after 1 year. Clin Implant Dent Relat Res. 2007 Mar;9(1):34-45.

BACKGROUND: Conventional implant protocols advocate a two-stage technique with a load-free, submerged healing period. Recent studies suggest that immediate restoration of single implants may be a viable treatment option.

PURPOSE: The purpose of this study was to evaluate prosthodontic and aesthetic peri-implant mucosal outcomes of immediately restored, Southern single-tapered implants in the anterior maxilla after 1 year.

MATERIALS AND METHODS: Participants (mean age: 43.25 years; range: 23-71 years) satisfying specified inclusion criteria were randomly allocated to conventional two-stage restoration (control group; n=14) and immediate restoration groups (test group; n =14) in a randomized controlled clinical trial. Tapered, roughened-surface Southern implants were placed using a standardized technique, and implant level bone impressions were made. Provisional screw-retained crowns, out of occlusion, were placed at second-stage surgery after 26 weeks for the conventional restoration group, and within 4 hours of implant placement for the immediate restoration group. Both groups had definitive screw-retained metal-ceramic crowns placed in occlusion 8 weeks later. Peri-implant mucosal response and papilla index were recorded 4 weeks after definitive crown placement to allow for mucosal maturation and at 1 year. Prosthodontic and aesthetic outcomes were assessed using established criteria.

RESULTS: There were no significant differences within, or between, the control and test groups for age, gender, bone quality or quantity, implant stability measurements at surgery, or implant length. There were no significant differences in the implant success rate as determined by radiographic bone loss and stability tests after 1 year. There were no significant differences in prosthodontic maintenance, peri-implant mucosal response, and papilla index between the two groups over 1 year.

CONCLUSIONS: Tapered, roughened-surface implants immediately restored with single provisional crowns at surgery and definitive crowns 8 weeks later were as prosthodontically and aesthetically successful as conventionally restored two-stage implants during the first year of service. Restoring single implants immediately with screw-retained crowns is an efficient procedure, but the short-term outcome is by no means superior to a conventional two-stage approach.

Kurtzman G.M., Dompkowski D.F., Mahler B.A., Howes D.G., Off-Axis Implant Placement for Anatomical Considerations Using the Co-Axis Implant Inside Dentistry vol. 4, no.5 May 2008 P96-102

CONCLUSION: The use of tilted implants is being advocated by an increasing number of clinicians. Numerous possible benefits of the tilted placement of implants are found in the literature, including: significant reduction of bone grafting procedures resulting in shorter total treatment time, less patient morbidity, decreased cost, and possible immediate or early restoration which otherwise might be precluded when used in conjunction with most bone-grafting procedures; an increase in anterior-posterior spread, resulting in a more stable prosthesis; the elimination or shortening of cantilevers; the avoidance of various anatomical structures; and the facilitation of screw retention and common path of draw of implant-supported prostheses.

Placement of tilted implants into the patient's available bone is usually easier for the surgeon than additional grafting procedures, with less morbidity. One possible disadvantage of the tilted placement of conventional

dental implants is that they usually become more difficult to restore. Anatomical considerations may complicate the prosthetic phase of implant treatment. When using cemented restorations, costly custom abutments with extreme angles are often required. These angles often take up valuable space, potentially creating esthetic and/or soft tissue complications. In screw-retained cases, costly angled intermediate abutments create the same potential problems and also have a second, smaller-diameter screw.

A recently developed solution to the difficulty in restoring tilted implants is the Co-Axis implant, with its 12° prosthetic axis correction built into the implant itself. This implant, therefore, helps to simplify the restoration of tilted implants, as it can overcome these issues permitting shorter treatment times and lower treatment costs. Therefore, the surgical dentist has the ability to place the implant in an ideal position and rotate it so that the restorative platform is in a position for easier restoration.

Kurtzman G.M., Dompkowski D.F. Case report: Immediate molar placement with Southern Implants MAX AAID Annual Meeting vol. 1, no.1., Nov. 2008

CONCLUSION: The MAX implants from Southern Implants permits immediate placement into extraction molar sites. As this implant is able to achieve initial primary stability filling the extraction socket, the need for socket grafting is greatly reduced and this shortens the treatment time associated with molar extraction sites in the observed delayed implants placement approach.

Vandewedhe S., De Bruyn H, The Effect of Smoking on Early Bone Remodeling on Surface Modified Southern Implants Clinical Implant Dentistry and Related Research vol 9999, no. 9999, September 2009 P1523-0899

CONCLUSION: The Southern Implants system demonstrated a high absolute survival rate. Although smokers are not more prone to implant loss, more pronounced peri-implant bone loss was observed, especially in the maxilla. Whether this affects future biological complications remains to be investigated in prospective long-term studies.