**Critically Appraised Topic (CAT)**

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| **Project Team:** |
| **1B-3** |
| **Project Team Participants:** |
| **Soren Paape, Austin Mahlik, Ciara Schwarz, and Jacob Landon** |
| **Clinical Question:** |
| **What is the success of implants placed in patients with relative contraindications that may impact healing including an infected site and diabetes?** |
| **PICO Format:** |
| **P:** |
| **Adult patient receiving an implant placement** |
| **I:** |
| **Relative contraindications including an infection site and diabetes** |
| **C:** |
| **No contraindications** |
| **O:** |
| **Survival rates** |
| **PICO Formatted Question:** |
| **In an adult patient receiving a dental implant, how do relative contraindications including an infected site and diabetes compared to no contraindications influence the survival rate?** |
| **Clinical Bottom Line:** |
| **“There are no absolute contraindications to implant placement. Patients who were over age 60, smoked, had a history of diabetes, had a history of head or neck radiation, or were postmenopausal and on hormone replacement therapy experienced significantly increased implant failure compared to healthy patients.”**  **“Implants placed in peri-apical sites does not statistically influence the survival rate of the implant.”**  **“You must take a CBCT and determine if you have a good potential for building buccal bone. If not, delayed implant protocol might be considered, specifically in the aesthetic zone.”**  **“Few studies show a decrease in survival rate of type 1 diabetics compared to control, as well as no change in type 2 diabetics compared to control.”** |
| **Date(s) of Search:** |
| **September 16th, 2020** |
| **Database(s) Used:** |
| **PubMed** |
| **Search Strategy/Keywords:** |
| **Implant Placement, Dental Treatment, Peri-apical Infection** |
| **MESH terms used:** |
| **Implant Placement, Dental, Infection, Contraindications** |
| **Article(s) Cited:** |
| Ausra, R., & Schwarz, F. (2019). The dimensions of the facial alveolar bone at tooth sites with local pathologies- A cone-beam CT analysis. doi:10.26226/morressier.5d3880b73ceb062ea26e4d4a  Chrcanovic, B. R., Martins, M. D., & Wennerberg, A. (2013). Immediate Placement of Implants into Infected Sites: A Systematic Review. *Clinical Implant Dentistry and Related Research,* *17*. doi:10.1111/cid.12098  Lindeboom, J. A., Tjiook, Y., & Kroon, F. H. (2006). Immediate placement of implants in periapical infected sites: A prospective randomized study in 50 patients. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology,* *101*(6), 705-710. doi:10.1016/j.tripleo.2005.08.022  Tawil, G., Younan, R., Azar, P., & Sleilati, G. (jul-aug 2008). Conventional and advanced implant treatment in the type II diabetic patient: Surgical protocol and long-term clinical results. *Int J Oral Maxillofac Implants,* *23*(4), 744-752. |
| **Study Design(s):** |
| **Lindeboom 2006 – Individual Randomized Controlled Trial**  **Chrcanovic 2013 – Systemic Review**  **Ausra 2019 – Individual Randomized Controlled Trial**  **Tawil 2008 – Individula Randomized Controlled Trial** |
| **Reason for Article Selection:** |
| **Lindeboom 2006 determined clinical success when implants are placed in periapical infected sites.**  **Chrcanovic 2013 reviewed the literature regarding treatment outcomes of immediate implant placement into sites exhibiting pathology after clinical procedures to perform the decontamination of the implant’s site.**  **Ausra 2019 assessed the impact of various local pathologies on facial alveolar bone dimensions at tooth sites.**  **Tawil 2008 investigated the effect of type-2 diabetes on implant survival and complication rate.** |
| **Article(s) Synopsis:** |
| **Lindeboom 2006 –**  **Method: Fifty patients were randomized and 25 implants were immediately placed after extraction, and 25 implants were placed after 3 month healing period. 32 implants were placed in the anterior maxilla and 18 implants were placed in the premolar region. Implant survival, mean Implant Stability Quotient (ISQ) values, gingival aesthetics, radiographic bone loss, and microbiologic characteristics of periapical lesions were evaluated for both groups.**  **Results: 2 implants in the immediate placement group were lost (92% survival rate) and 0 implants in the 3-month healing period were lost (100% survival rate). Mean ISQ, gingival aesthetics and radiographic bone resorption, and periapical cultures were all not significantly different with the immediate placement and 3-month healing period implants.**  **Conclusion: Slightly lower survival rate in implants placed in periapical infected sites for immediate placement; however, this was not a statistically significant difference. However, we may want to consider delayed implant protocol in the aesthetic zone due to recession at the level of the mid-buccal gingiva.**  **Chrcanovic 2013 –**  **Methods: Electronic search in PubMed was performed. The titles and abstracts from these results were read to identify studies within the selection criteria. The publication's intervention had to have been implant placement into a site classified as having an infection.**  **Results: The study search had 706 references with 32 in the selection criteria. Of these 32, nine were case reports and review articles which were excluded. Additional hand-searching of reference lists yielded five more papers. A total of 25 papers were used.**  **Conclusion: High survival rates obtained in several studied supports that implants may be successfully osseointegrated when placed immediately after extraction of teeth presenting endodontic and periodontic lesions with proper surgical procedure. Issues included vague classification of the infection (periapical, endodontic, perioendodontic, and periodontal) as well as a longer follow-up for confirmation.**  **Ausra 2019 –**  **Method: Con-beam images of 60 patients were analyzed. Healthy teeth and teeth with local pathologies (endo, periodontally diseased, and teeth with PA lesions) were included. The thickness of facial alveolar bone was measure at the bone crest as well as 25%, 50%, and 75% from the distance of the bone crest to the root apex.**  **Results: 1174 teeth were assessed. Periodontally diseased maxillary premolars and anterior teeth in the mandible at the bone crest, as well as maxillary molars at 25% distance from the bone crest to the root apex had lower facial bone thickness when compared to healthy teeth. One contrast to the hypothesis was mandibular diseased anterior teeth 50% from the bone crest to the root apex had a thicker bone wall.**  **Conclusions: Overall the results were statistically significant that local pathologies are commonly associated with a compromised socket morphology.**  **Tawil 2004 –**  **Method: Participants were type-2 diabetes with edentulism, had a mean HbA1c level of 7.2%, and compliant with a maintenance program. Clinical diabetes-related factors and periodontal parameters on implant survival were assessed.**  **Results: Implant survival following conventional or advanced implant therapy was not statistically different between the well controlled (HbA1c < 7%) and the fairly well-controlled (HbA1c from 7-9%). Overall survival rate for the diabetic group was 97.2% (control 98.8%) and was not significantly different for age, gender, diabetes duration, smoking, or type of hypoglycemic therapy.**  **Conclusion: No statistically significant difference was found for patients or for implants for the advanced surgery cases or conventional approach in type-2 diabetic patients compared to nondiabetic patients.** |
| **Levels of Evidence:** (For Therapy/Prevention, Etiology/Harm)  See <http://www.cebm.net/index.aspx?o=1025>  **1a** – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)  **1b** – Individual RCT  **2a** – Systematic Review of Cohort Studies  **2b** – Individual Cohort Study  **3** – Cross-sectional Studies, Ecologic Studies, “Outcomes” Research  **4a** – Systematic Review of Case Control Studies  **4b** – Individual Case Control Study  **5** – Case Series, Case Reports  **6** – Expert Opinion without explicit critical appraisal, Narrative Review  **7** – Animal Research  **8** – In Vitro Research |
| **Strength of Recommendation Taxonomy (SORT) For Guidelines and Systematic Reviews**  See article **J Evid Base Dent Pract 2007;147-150**  **A** – Consistent, good quality patient oriented evidence  **B** – Inconsistent or limited quality patient oriented evidence  **C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening |
| **Conclusion(s):** |
| **Based on Lindeboom 2006 and Chrcanovic 2013, the survival rates of implants placed in peri-apical sites implant placement does not statically influence the survival rate of implant placement compared to no implant placement. However, based on Lindeboom 2006 and Ausra 2019, you must take a CBCT and determine if you have a good potential for building buccal bone. If not, delayed implant protocol might be considered, specifically in the aesthetic zone.** **Tawil 2008 determined there was no difference for advanced surgery cases or conventional approach in type-2 diabetics compared to nondiabetic patients.** |