**Critically Appraised Topic (CAT)**

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| **Project Team:** |
| **Carly Kirkpatrick (myself)**  **Joel Ledvina**  **Hanna Anderson**  **Anna Langworthy** |
| **Project Team Participants:** |
| **Dr. Brunner** |
| **Clinical Question:** |
| **When can you safely recommend immediate implant placement?** |
| **PICO Format:** |
| **P:** |
| **Healthy adult patient with missing tooth/helpless tooth requiring restoration** |
| **I:** |
| **Immediate implant placement** |
| **C:** |
| **Two-stage implant therapy** |
| **O:** |
| **Long term survival of first molar sites with single tooth restoration** |
| **PICO Formatted Question:** |
| Among healthy adult patients requiring single implant restoration in first molar sites, when can immediate implant placement be recommended over two-stage implant therapy? |
| **Clinical Bottom Line:** |
| Immediate implant placement has clinically comparable outcomes to two stage implant therapy and can be safely used within the scope of experienced clinicians. |
| **Date(s) of Search:** |
| **9/15/2020, 9/16/2020** |
| **Database(s) Used:** |
| **Pubmed** |
| **Search Strategy/Keywords:** |
| **Dental implant, immediate placement, two stage** |
| **MESH terms used:** |
| **Dental implant, immediate placement, two stage** |
| **Article(s) Cited:** |
| * **Ketabi, Mohammad, et al. “A Systematic Review of Outcomes Following Immediate Molar Implant Placement Based on Recently Published Studies.” *Clinical Implant Dentistry and Related Research*, vol. 18, no. 6, 2016, pp. 1084–1094., doi:10.1111/cid.12390.** * **Ragucci, G.M., Elnayef, B., Criado-Cámara, E. *et al.* ”Immediate implant placement in molar extraction sockets: a systematic review and meta-analysis.”  *Int J Implant Dent* 6, 40 (2020).** [**https://doi.org/10.1186/s40729-020-00235-5**](https://doi.org/10.1186/s40729-020-00235-5) * **Amin, Viraj, et al. “A Clinical and Radiographical Comparison of Buccolingual Crestal Bone Changes after Immediate and Delayed Implant Placement.” *Medicine and Pharmacy Reports*, 2019, doi:10.15386/mpr-1213.** |
| **Study Design(s):** |
| * **Article 1: Systematic Review** * **Article 2: Systematic review and meta-analysis** * **Article 3: RCT** |
| **Reason for Article Selection:** |
| * **Article 1: (Ketabi et al)**   + **Directly applied to PICO**   + **Looked specifically at mandibular molar implants** * **Article 2: (Ragucci et al)**    + **Directly applied to PICO question – immediate implant placement in molar sites**   + **Recent data of high evidence emphasizing consistency in results from previous meta-analysis** * **Article 3: (Amin et al)**    + **Directly compares immediate to delayed implant placement**   + **Can be used to weigh effects of choosing between immediate vs. delayed** |
| **Article(s) Synopsis:** |
| **Article 1 (Ketabi et al):**   * **Method**   + **Systematic search of literature published from November 2008-May 2015 using databases: Embase, Ovid Medline, Pubmed, Scopus, ISI, Cochrane**   + **PICO format allowed definition of the study objectives**   + **15 studies included providing data on 768 immediate molar implants in 757 patients**   + **Meta-analysis performed to compare survival rate and mean bone loss** * **Results**    + **Implant survival rate of 98%, no difference between maxilla and mandible**   + **5 studies included delayed molar implants as controls, no significant differences noted**   + **Higher implant failure for ultra-wide vs. wide diameter implants**   + **Overall cumulative bone loss after 1 year = .57 mm**   **Conclusions**   * + **Data suggests high success rates with immediate implant placement of molars, and that there may be an optimal diameter for this procedure (wide 4-6 mm).**   **Limitations**   * + **Quality of the 15 studies were regarded as “fair to average”**   + **No published reports from double-blind, randomized controlled clinical trials**   **Article 2: (Ragucci et al):**   * **Method**   + **literature review of Pubmed, Cochrane and MEDLINE electronic databases**   + **Two independent reviewers screened and slected**   + **20 articles included, 990 patients and 1,106 implants analyzed**   + **Meta-analysis performed on selected articles using 95% confidence interval** * **Results**    + **Overall:**     - **97.8% survival rate**     - **938.1% success rate**   + **Posterior Mandible:**     - **97.4% survival rate**     - **97.5% success rate**     - **(less than maxilla but not significantly significant.**   + **Estimated MBL over 1 year 1.29 +/- .24 mm**   + **Higher implant success in grafted vs. non grafted**   + **Higher implant survival in < 5 mm diameter group vs >5 mm**   **Conclusions**   * + **Immediate implant placement in molar extraction socket might be considered a predictable technique as demonstrated by high survival and high success rates with minimal bone loss**   **Limitations**   * + **Included articles of lower evidence in the review – case series, cohort, retrospective studies**   + **Had to exclude an article with sample size of 12 implants from meta-analysis due to it effecting overall outcome**   + **Not all articles had a ‘comparison group’**   **Article 3: (Amin et al)**   * **Method**   + **50 subjects needing extraction and replacement with dental prosthesis in anterior and premolar region**   + **Group A: immediate implants, Group B: implant placement delayed 6-8 weeks post extraction**   + **All implants submerged within alveoli confines, primary flap closure ensured**   + **Bone grafts only placed if jumping distance more than 1.5 mm**   + **No barrier membrane placed**   + **BL width measured at time of implant placement and during abutment placement (6 mo)** * **Results**    + **31 implants placed in mandible, 19 placed in maxilla**   + **All implants successful , all achieved osseointegration with no mobility**   + **No statistically significant comparisons between group A and B**   **Conclusions**   * + **Data in both groups suggest that the circumferential defect around implant will heal on itself without guided bone regeneration. Healing in both groups were equally good.**   + **Immediate implant placement saves cost, time, and need for extra surgery**   **Limitations**   * + **This focused on premolar region rather than molar region**   + **Small sample size – 50 subjects**   + **Short follow up period – would prefer longer** |
| **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):** |
| * + **Literature suggests that immediate implant placement is comparable to delayed/two-stage implant placement in terms of osseointegration, healing, success and survival.**   + **Discussion with Dr. Brunner about his clinical experience further provided evidence that immediate implant placement is a comparable treatment option**   + **Patient wants to limit number of appointments and is eager to get the implant placed. Not overly concerned with cost.**   + **For this patient would recommend offering immediate implant placement as a safe, time efficient, and comparable alternative to delayed, two-stage.** |