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| **Name:** |
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| **Pathology Question:** |
| What causes implants to fail? |
| **Report:** |
| Implant failure occurs when the implant fails to achieve its function (Al-Sabbagh and Bhavsar, 2015). Failure can be grouped into four categories. The first form of failure occurs when osseointegration is not achieved or sustained. The second form is associated with mechanical failure of the implant, abutment, or prosthesis. The third type of failure occurs when the implant, abutment, or prosthesis violates anatomic structures. The fourth type of failure is characterized by adaptation failure that involves patient related lack of satisfaction with the treatment outcome. (Esposito et al., 1998)  Osseointegration is critical for the success of the implant, and is defined as “*a direct connection between living bone and a load-carrying endosseous implant at the light microscopic level*“ (Branemark and Chien, 2005). Osseointegration failure can occur at two main timepoints in the implant treatment: early and late. Early failure occurs when osseointegration is not achieved during the normal bone healing process. Early failure is exhibited by peri-implant radiolucency and implant mobility (Al-Sabbagh and Bhavsar, 2015). Risk factors for early failure include trauma, bacterial contamination, delayed wound healing, and premature loading of the implant. Late failure occurs when osseointegration is not sustained. This form of failure is associated with peri-implantitis. Peri-implantitis is exhibited by bone loss surrounding the implant and bleeding on probing. Risk factors for late failure and peri-implantitis include lack of regular supportive therapy, poor oral hygiene, and smoking (Jepson et al., 2015).  Generalized risk factors for implant failure are varied. They can be host related factors or external factors. The most well supported host related factors include metabolic diseases, smoking, poor oral hygiene, history of periodontal disease, poor bone quantity and quality, and limited width of keratinized gingiva. External risk factors include operator inexperience, poor aseptic technique, poor surgical technique, and non-optimal implant design (Al-Sabbagh and Bhavsar, 2015). |
| **References:** |
| 1. Al-Sabbagh, M., & Bhavsar, I. (2015). Key Local and Surgical Factors Related to Implant Failure. *Dental Clinics of North America,59*(1), 1-23. doi:10.1016/j.cden.2014.09.001 2. Esposito, M., Hirsch, J., Lekholm, U., & Thomsen, P. (1998). Biological factors contributing to failures of osseointegrated oral implants, (II). Etiopathogenesis. *European Journal of Oral Sciences,106*(3), 721-764. doi:10.1046/j.0909-8836..t01-6-.x 3. Branemark, P., & Chien, S. (2005). *The osseointegration book from calvarium to calcaneus*. Berlin: Quintessenz-Verl.-GmbH. 4. Jepsen, S., Berglundh, T., Genco, R., Aass, A. M., Demirel, K., Derks, J., . . . Zitzmann, N. U. (2015). Primary prevention of peri-implantitis: Managing peri-implant mucositis. *Journal of Clinical Periodontology,42*. doi:10.1111/jcpe.12369 |