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| **Name:** |
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| **Group:** |
| 9B-3 |
| **Pathology Question:** |
| What are the classifications and locations of the different types of bone densities within the jaw |
| **Report:** |
| The jaw is made up of cortical and trabecular bone. At the microscopic level, the differences between cortical and trabecular bone in the jaw are apparent. Cortical bone is stiffer and able to resist higher stress than trabecular bone. However, cortical bone is more brittle. In terms of impant dentistry, the cortical lamellar bone can heal with little woven bone formation which yields bone strength while healing next to the implant. Trabecular bone in the jaw is sparse which results in a surgical challenge during the initial fixation of the implant. The intial bone-impant contact after the intial loading in trabecular bone is usually less than 25%. The Misch bone density classification defines four bone density types found in all the regions of the jaw- D1-D4. D1 bone density is dense cortical bone. D2 bone density is porous cortical and coarse trabecular bone. D3 is thin porous cortical and fine trabecular bone. D4 is classified as fine trabecular bone. The Anterior maxilla region has D3 bone with the occasional D2 bone. The posterior maxilla region usually has D4 bone. The posterior maxilla region can have D3 bone 6 months after a sinus graft. The anterior mandibular region usually has D2 bone. However, in some resorbed mandibular bone scenerios the bone density is classified as D1. The posterior mandibular region usually has D3 but can occasionally have D2. The trabecular bone in a D4 region of the jaw can be up to 10 times weaker than the cortical bone found in the D1 jaw regions. An impant placed in a D4 area with low density and little to no crestal bone has a higher chance of failure compared to impants placed in other areas with a higher cortical bone presence (D1). Therefore, implant success is generally most predictable in D1/D2 bone (anterior mandible) and D3/D4 (posterior maxilla) has the most complications/failures. Several studies have reported higher implant failure rates in the posterior maxilla. Additionally, when compared to the maxilla, the mandible has a higher impant success rate, specifically the posterior mandible. |
| **References:** |
| Gulsahi, Ayse. (Sep 2011). Bone Quality Assessment for Dental Implants. 10.5772/16588. https://www.researchgate.net/publication/221917615\_Bone\_Quality\_Assessment\_for\_Dental\_Implants  "Bone Density for Dental Implants." *Pocket Dentistry*, 12 Apr. 2015, pocketdentistry.com/bone-density-for-dental-implants/  Osterhoff, Georg et al. “Bone mechanical properties and changes with osteoporosis.” *Injury* vol. 47 Suppl 2,Suppl 2 (2016): S11-20. doi:10.1016/S0020-1383(16)47003-8 |