

IMPLANTS

(/spear-review/category/implants/)

Risks of Using Worn Implant Wrenches

By Jeffrey Bonk (/spear-review/author/jeff-bonk/) on December 11, 2018 |  (/bookmarks/bookmark/39419)

Recently, a situation occurred in my office regarding some difficulty in the removal of an implant (<https://www.speareducation.com/spear-review/category/implants>) healing cap. My patient, Barb, lost her tooth due to structural failure. I referred her to my periodontist colleague for tooth extraction and implant placement. Barb's situation was routine. The tooth was removed, and a few months later, the implant (with a healing cap) was placed. This is a procedure and process I've repeated many times over the years with this periodontist. In the past, when the implant was healed, the healing cap was removed and the restorative process ensued, uneventfully, to the final restoration.

Barb's case was different. Barb returned to my office with the implant healed and ready to begin the restorative process. My assistant handed me the appropriate implant wrench to remove the healing cap. I inserted the wrench into the receptor and attempted to remove the cap. Normally, healing caps are finger-tightened by the periodontist and are easily removed. But with my fingers, Barb's did not budge.

I applied the 10 Ncm torque wrench ... nothing! Then the 20 Ncm wrench. Still nothing. So I attached the 35 Ncm torque adapter. I verified I was turning in the correct direction ("righty tighty, lefty loosey"). As I began to torque, I suddenly felt a slight "give" or "release." But that "give" was, unfortunately, not the loosening of the healing cap - it was the beginning sensation of the "stripping" of the wrench! I immediately stopped my attempts to loosen the healing cap.

I realized my wrench (and other wrenches I checked) was showing signs of wear. The hex corners and angles were not as "sharp" and "defined" as they once were. I referred Barb to the periodontist to have the healing cap removed before I inflicted permanent damage to the hex.

There is a happy ending to Barb's implant. The cap was removed, the final restoration inserted and she is happy with the end result.

But this situation created significant awareness about maintaining and managing the tools and equipment we use in our everyday practices. My staff is very good about equipment maintenance. From handpiece lubrication, to instrument sterilization and copy machine ink, they are detailed and thorough in the management of office equipment and supplies. Maintenance regimens for equipment are dated and placed in the annual calendar for regular evaluation and assessment. Specific staff members are assigned to various tasks to ensure consistency of care. I am sure my office is no different than anyone's when it comes to the organization and structure applied to operation and maintenance.

But Barb's case brought to our attention a small but important factor we have seemingly overlooked. The wear and tear of our implant wrenches has significant implications for our predictability and success. The dental literature contains many studies and information regarding accuracy and precision of torque wrenches, torque measurements and maintenance schedules and techniques for proper force. But there is no literature regarding wear and deterioration of the wrenches themselves.

[Live Chat](#)

2



The images indicate a visual comparison of implant wrench tips. The tips of implant wrenches that have been used in numerous circumstances are worn and have rounded corners. The new wrenches indicate sharp corners and accurate hexes. These wrenches are 0.5 mm and 0.48 mm tip hex wrenches. It is visually apparent that the worn wrench tips are significantly smaller in dimension than the new counterparts. It is eye-opening!

When was the last time you replaced the implant wrenches in your office? I predict that it was when a² wrench was misplaced. If you are like me, implant wrenches are tools we expect to be present and utilize when we open our sterilized implant kits for insertion or removal appointments. We use the appropriate wrench and return it to the kit for re-sterilization and re-use. There is not likely a system in place for number of times used or age of the wrenches themselves. It was the circumstance with my patient Barb that made us realize the negative effects of wrench wear.

Other risks of using worn implant wrenches

Another consideration is the possibility of wrench fracture due to internal stress and fatigue from continuous torquing pressure. We are very aware of torquing pressures for implant screws. We are cautious about how much torque and how many times an implant screw is subjected to torquing pressure (one screw/one time is recommended). Screw fracture can be a catastrophic dilemma for a patient. But should a wrench fracture from overload, there is the risk of patient injury from applied force - or worse, aspiration of segments.

I contacted Dentsply Astra Implant Company. Following a discussion of my concerns with Brian Bashaw, director of implant sales training and development, there is apparently no formal or scientific recommendation period or time frame for implant wrench replacement.

Brian did, however, raise another consideration or concern. It is possible that implant screw loosening may be the result of achieving improper torque values when using a worn wrench at the time of final abutment placement. Inadequate engagement of the wrench and screw head may result in a “wrench slip” upon torque application.

Barb’s case raised my awareness level of the importance of implant wrench quality control. Since this case, a wrench replacement system has been initiated in my practice. Our wrench purchase dates have been documented and placed into our office calendar. Our wrenches will now be visually evaluated annually and replaced every two years, regardless of appearance. This policy correlates with our maintenance policies for torque wrench calibration. Each torque wrench is returned to the appropriate implant company, on an annual basis, for re-calibration, cleaning and inspection.

I would suggest that a replacement schedule for torque wrenches be adapted, as is done for managing other dental equipment and instruments. I don't want to “throw a wrench” into your systems, but I would hate to see you get “torqued off”!

References

Intended and Achieved Torque of Implant Abutment's Screw using Manual Wrenches in Simulated Clinical Setting. (<https://www.ncbi.nlm.nih.gov/pubmed/27965497>) Al - Otaibi HN. J Contemp Dent Pract. 2016 Nov 1;17(11):897-901.

Intended and Achieved Torque of Implant Abutment's Screw using Manual Wrenches in Simulated Clinical Setting. (<https://www.ncbi.nlm.nih.gov/pubmed/27965497>) Al-Otaibi HN. J Contemp Dent Pract. 2016 Nov 1;17(11):897-901.

Accuracy of dental torque wrenches. (<https://www.ncbi.nlm.nih.gov/pubmed/26545283>) Wood JS, Marlow NM, Cayouette MJ. Gen Dent. 2015 Nov-Dec;63(6):e20-2.

The Precision of Mechanical Torque Wrenches Used for Implants in Dental Offices. (<https://www.ncbi.nlm.nih.gov/pubmed/26340015>) Steinebrunner L, Harder S, Wolfart S, Freitag-Wolf S, Kern M. Int J Prosthodont. 2015 Sep-Oct;28(5):527-30. doi: 10.11607/ijp.4281.

Comparison of design and torque measurements of various manual wrenches. (<https://www.ncbi.nlm.nih.gov/pubmed/26009903>) Neugebauer J, Petermann S, Scheer M, Happe A, Faber FJ, Zoeller JE. Int J Oral Maxillofac Implants. 2015 May-Jun;30(3):526-33. doi: 10.11607/jomi.3733.