

LETTER TO THE EDITOR

Dental torque wrench: Relevance in implant dentistry and influence of use

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Purpose of the letter

The field of implant dentistry is constantly developing and improving, with the emergence of new surgical and prosthetic kits, possibilities for new materials to manufacture dental implant screws, among other research. However, a relevant aspect that has been observed clinically but little discussed is the accuracy of the measurements made by dental torque wrenches and their possible complications associated with clinical use. Therefore, this article aims to introduce the reader to the main methods used to record this scale and induce reflection on how these different methods, influenced by the clinical use of the instrument, may affect its performance.

Dear Editor

As a result of the frequent studies carried out in the field of implant dentistry, it can now be seen that this is a dental specialty that is constantly being developed and improved. The literature stipulates that dental prostheses on implants are ideal for the treatment of partially or totally edentulous patients, as they improve aesthetics and masticatory function, as well as reducing bone resorption in edentulous areas.¹

According to a study carried out by Adell et al. (1981),² osseointegration is described as a “firm, direct and durable connection between vital bone and fixed screw-retained titanium implants with a defined coating and geometry”, and adequate insertion torque is essential for this stable connection to occur. When the torque applied and measured using a dental torque wrench is inadequate (insufficient or exacerbated), it can result in loosening, instability, fracture, reduced implant longevity and even failure of osseointegration.³

Therefore, the use of appropriate techniques and instruments is essential for the success of the procedure.

During in vitro research carried out in the field of implant dentistry, it was observed that some mechanical dental torque wrenches, Friction Style and Spring Style, surgical and prosthetic, had different methods of recording the values of their reference scale, presenting themselves as: mechanical engraving (reference scale recorded by wearing away the metal surface of the torque wrench) and laser engraving (reference scale recorded by laser with minimal penetration of the metal).

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In this context, it was observed that mechanical dental torque wrenches with long periods of clinical use (years), in which the reference was recorded using laser engraving, had values that were difficult for the researchers to identify because the scale had faded (Figure 1). On the other hand, mechanical dental torque wrenches with periods of use similar to those mentioned above, but in which the reference was recorded using mechanical engraving, it was still possible to discern the values recorded on the reference scale of these instruments more easily (Figure 2).

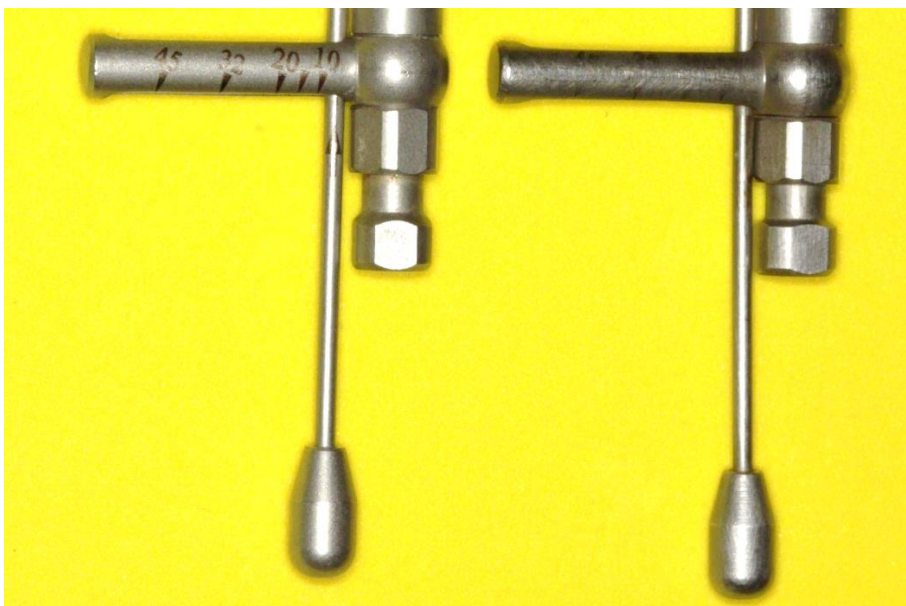


Figure 1. Dental torque wrenches with reference stem recorded by laser engraving. On the left, torque wrench with less clinical use and observable reference, on the right, torque wrench with more clinical use and illegible reference.

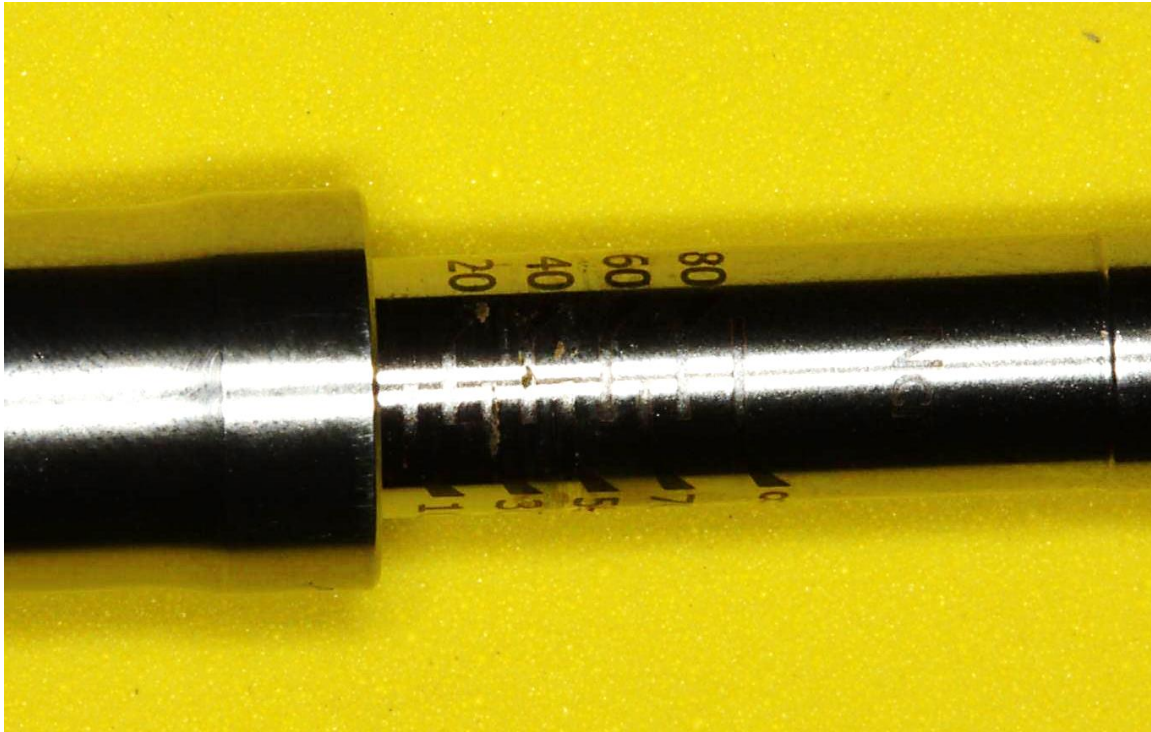


Figure 2. Dental torque wrench with reference rod registered by means of metal engraving.

Therefore, the challenge of using a torque wrench with a deteriorated scale is clear, as it makes it impossible to correctly interpret the values of the reference scale stipulated by the manufacturer, thus compromising the precision of surgical and prosthetic treatments in implantology, as well as clinical success. After extensive research in the literature, there was no mention of this issue, despite it being clinically observable and relevant.^{4,5,6,7}

Current research in implantology includes various analyses of the clinical success of prosthetic and surgical procedures, *in vitro* and *in vivo* studies for the possibility of new materials, techniques, protocol development and clinical conduct. However, there is little discussion about the relationship between the useful life of the dental torque wrench and the durability of the method used to record its reference scale. It has been observed that the instrument is still working properly, but when its scale becomes unreadable, the torque wrench ends up being unusable.

Due to the relationship of dependence between the reference scale and the torque wrench, in order to properly apply the desired torque, it is important for the dental surgeon and his team to take care when sanitizing, handling and caring for precision instruments, as well as for the industry to constantly evaluate and develop its products in order to extend the useful life of the instruments and, in the specific case of dental torque wrenches, maintain the precision required for surgical and prosthetic procedures in implant dentistry.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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