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Assessment of burr wear after several uses in bone drilling for the installation of dental implants

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Resumo:

The use of osseointegrated implants has brought a new reality in oral rehabilitation, as they will replace the roots of missing teeth to create a new tooth. To be successful in the installation of these implants and consequently in the osseointegration and longevity of this implant in function, several aspects must be observed, one of the main ones being the creation of the surgical socket. At this stage, the bone region that will receive the implant will undergo a sequence of milling, in such a way as to progressively and gradually enlarge the bone until the desired diameter and length for installing the implant is reached. When carrying out this surgical procedure, several burrs are used successively. During this surgical procedure, abundant irrigation must also be used. These factors are important so that excessive heating does not occur during bone milling, as it is known that it cannot exceed 47 °C, as temperatures above this can generate bone necrosis and consequently interfere with or even make the process unfeasible of osseointegration. Among these precautions, the use of cutters is of fundamental importance, as they suffer wear and tear with successive use. The recommendation has been to use these for approximately 20 perforations. Based on the above, the present work aimed to evaluate the wear occurring on the surface of the cutters, as well as whether there was any damage to the DLC (diamond-like carbon) coating. 50 perforations were made, with each drill, in

bovine ribs, following the recommended sequence for the installation of implants with 4 mm in diameter and 13 mm in depth. Two groups were made. In group G1, burrs without irrigation were used, and in group G2, burrs with irrigation were used. For each group, 3 milling sequences were performed. After this step, the cutters were observed under SEM (scanning electron microscopy) and also under optical microscopy - MO. It was observed that these undergo rounding in the cutting angles and that at some points the DLC layer is pulled out. These findings may suggest that the use of already worn cutters may generate higher than desired heating. These findings imply that the burs must be replaced after a suggested number of millings of between 25 and 30 times, in order not to compromise osseointegration during this procedure.