



How Can Ultrasonic and Power Toothbrush Technologies Better Serve the Client with Dental Implants?

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The success of dental implants relies heavily on the health of the surrounding soft tissue. The dental hygienist plays a critical role in determining in-office assessment and debridement interventions, as well as at-home client-specific biofilm control strategies. Studies have demonstrated the importance of using aids and technologies that will not only remove as much biofilm as possible, but will also be safe to use on the outer surface of dental implant abutments, attachments or bars in the prevention of peri-implant bone loss.^{1,2,3} It is imperative to choose oral self-care strategies and non-surgical periodontal therapies that focus on eliminating the majority of the biofilm. Unless prior damage has been done to the implant, one can assume that dental biofilm and calculus are not strongly attached. We also have to remember that the peri-implant connective tissue is more vulnerable to inflammation due to the decrease in its vascularity and the lack of true connective attachment in the implant environment.

So which technology can enhance at-home dental biofilm removal? When comparing manual versus power toothbrushes for everyday use, it is clinically proven that power toothbrushes remove significantly more biofilm than a regular toothbrush and, as a consequence, they have a greater positive impact on gingival health.⁴ Three popular power toothbrushes have been shown to be safe to use on titanium dental implants: Rotadent®, Oral-B oscillating-rotating design®, and Sonicare®.⁵⁻⁷ Softer bristles and smaller

brush heads can also facilitate access to interproximal areas, thus removing more biofilm. Results from a Philips Sonicare study demonstrated that the use of Sonicare Elite (or other power toothbrushes) does not affect implant retention strength in vitro for up to two years of simulated clinical

brushing with toothpaste.⁷ Furthermore, Hope and Wilson concluded that the Sonicare Elite toothbrush removed significantly more dental biofilm 2 mm to 3 mm beyond the reach of the bristles which is important in an environment where soft tissue can be greatly affected by inflammation.⁸

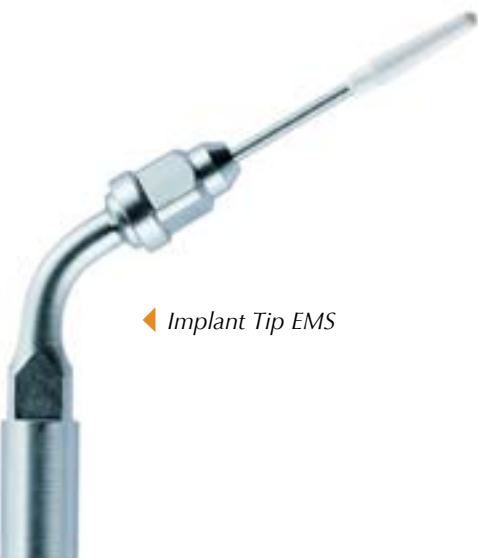
Numerous research studies have provided evidence that a variety of hand instruments made of plastic, Teflon®, graphite, titanium, titanium plating or gold could be

used for the debridement of dental implants in the dental office.⁹⁻¹² These implant-safe instruments do come with some limitations, whether it is the difficulty in accessing the implant sulcus or the lack of thoroughness in removing the subgingival biofilm, leaving us with treatment outcomes that can be less than ideal. Can ultrasonic instrumentation also benefit the dental implant environment? The answer is yes. The added benefit of ultrasonic therapy, its lavage, and increased disruption of the biofilm can only help in achieving healthy peri-implant tissue.¹³ In order to ensure that no irreversible damage is done to the implant mechanics, it is imperative that an implant-specific ultrasonic insert tip be used. Traditional metal ultrasonic inserts have been shown to create a severely roughened surface on Brånemark titanium implant abutments.¹⁴

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◀ Cavitron SoftTip by DENTSPLY



◀ Implant Tip EMS



▶ PH1 Implant Tip Satelec

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How Can Ultrasonic and...cont'd

Table 1. Implant-Safe Ultrasonic Inserts

Ultrasonic Technology	Manufacturer	Product Name	Description
Magnetostrictive	DENTSPLY Canada www.dentsply.ca	Cavitron® SofTip™	Plastic tip twisted onto a 30K implant insert Single use and disposable tip Change with wrench
	Parkell Inc www.parkell.com	GentleCLEAN™ Ultrasonic insert	Polyetherimide resin tip twisted onto a 30K implant insert Disposable Change with wrench
	Tony Riso Co. www.tonyriso.com	Titanium Implant Scaler (TIS-P)	Plastic tip* screwed onto a 25K or 30K implant insert Reusable for up to 8 patients Autoclavable
Piezoelectric	ACTEON Group www.acteongroup.com	PerioSoft™ Tips PH1, PH2R, PH2L	Carbon composite tips* Autoclavable 3 designs: straight, right, left Change with wrench
	Brasseler-Varios www.brasselercanada.com	V-Tip with removable implant tip	Plastic tip* used with the V-Tip Holder made of stainless steel Tip is interchangeable, autoclavable Change with wrench
	Hu-Friedy www.hu-friedy.com	PI - Implant tip	PEEK Plastic coating* (Polyether Ether Ketone fiber) applied on a stainless core Autoclavable Change with wrench

*After each use, check the integrity of the plastic tip/coating.

Implant-safe ultrasonic inserts come in a variety of forms and coatings (Table 1). All inserts should be used at the lowest power setting, with a maximum water flow, a feather-like pressure, and constant overlapping working strokes. Extreme care must be taken when working in the implant sulcus area to prevent any disruption of the fragile connective tissue surrounding the implant abutment.

In summary, to maintain implant health, both the client and the professional must strive to control the intraoral microbial environment with strategies proven to be biocompatible with the dental implant surfaces and effective in promoting gingival health, hence the use of ultrasonic debridement in the office and a power toothbrush at home.

References

1. AAP. Parameter on placement and management of the dental implant*. J Periodontol. 2000;71:870-72.
2. AAP. Peri-implant mucositis and peri-implantitis: A current understanding of their diagnoses and clinical implications. J Periodontol. 2013 Apr;84(4):436-43.
3. Silverstein L, Garg A, Callan D, Shatz P. The key to success: Maintaining the long-term health of implants. Dentistry Today. 1998;17(2):104-11.
4. Heasman PA, McCracken GI. Powered toothbrushes: A review of clinical trials. J Clin Periodontol. 1999;26:407.
5. Thomson-Neal D, Evans GH, Meffert RM. Effects of various prophylactic treatments on titanium, sapphire, and hydroxyapatite-coated implants: An SEM study. Int J Periodontics & Restorative Dent. 1989;9(4): 300-311.
6. Vandekerckhove B, Quirynen M, Warren PR, Strate J, van Steenberghe D. The safety and efficacy of a powered toothbrush on soft tissues in patients with implant-supported fixed prostheses. Clin Oral Investig. 2004 Dec;8(4):206-10.
7. Castellon R, Fernunson MA, Garcia-Godoy F, et al. Effect of power toothbrushes on retention strength of implant crowns and abutments under simulated clinical conditions. The Science Behind Sonicare [brochure]. Philips Oral Healthcare, Inc. Data on file, 2007. Available from www sonicare.it/pdf/Safety_E_2007_Castellon_IT-IT.pdf
8. Hope CK, Wilson M. Comparison of interproximal plaque removal efficacy of two power toothbrushes using in vitro oral biofilms. Am J Dent. 2002;15:7B-11B.
9. Mengel R, Buns CE, Mengel C, Flores-de-Jacoby L. An in vitro study of the treatment of implant surfaces with different instruments. Int J Oral Maxillofac Implants. 1998 Jan-Feb;13(1):91-96.
10. Rühling A, Kocher T, Kreusch J, Plagmann HC. Treatment of subgingival implant surfaces with Teflon-coated sonic and ultrasonic scaler tips and various implant curettes. An in vitro study. Clin Oral Implants Res. 1994 Mar;5(1):19-29.
11. Matarasso S, Quaremba G, Coraggio F, Vaia E, Cafiero C, Lang NP. Maintenance of implants: an in vitro study of titanium implant surface modifications subsequent to the application of different prophylaxis procedures. Clin Oral Implants Res. 1996 Mar;7(1):64-72.
12. Fox SC, Moriarty JD, Kusy RP. The effects of scaling a titanium implant surface with metal and plastic instruments: an in vitro study. J Periodontol. 1990;61:485-90.
13. Sato S, Kishida M, Ito K. The comparative effect of ultrasonic scalers on titanium surfaces: an in vitro study. J Periodontol. 2004;75(9):1269-73.
14. Rapley JW, Swan RH, Hallmon WW, Mills MP. The surface characteristics produced by various oral hygiene instruments and materials on titanium implant abutments. Int J Oral Maxillofac Implants. 1990 Spring;5(1):47-52.