

ART—a method on its way into dentistry

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In this issue of the journal, we present a comprehensive overview on the state of the art concerning Atraumatic Restorative Treatment (ART) [1]. Although quite a number of assessments including systematic reviews have been published on ART already, it was the intension of this article to describe the potentials and the limitations of ART for dentistry as such, i.e., an attempt to describe the role of ART in dentistry. The development of ART started in the eighties of the last century as a necessity to provide dental care in populations who were deprived of any dental treatment and whose alternative would have been and was so far: tooth extractions. Over the years, the ART method and the respective materials were further developed, and a large number of studies were published. Reports were available, e.g., on survival rates and on acceptance of this technique mainly in low- and medium-income countries, indicating that ART could indeed be regarded not only as an alternative to tooth extractions practiced so far but also as a way to improve dental health. These data have been the basis for respective WHO statements recommending this technique under these circumstances. But, not only was a new treatment method created, control criteria and hand instruments were also developed for this technique, which were designed to fit best these procedures. So far, so good.

However, with increasing success of this method in the above-described deprived populations, the idea was born that this method could be used in these populations instead of introducing classical dental treatment, like the placement of amalgam filling. Indeed, some studies performed in low- and medium-income countries showed for one-surface

cavities that ART revealed equally good results as classical restorations. Clear limitations were observed in larger than one-surface cavities.

Then, apparently, the idea emerged that ART would also be interesting for developed countries. In these countries, there are special population groups, like (small) children, the handicapped, and anxious or elderly patients, who could potentially benefit from such a treatment method due to many reasons. However, now, the alternative was not anymore tooth extraction, but classical dental treatment with the highly developed canon of sophisticated materials and methods, which had been developed over the recent decades. ART was entering a new arena.

Due to the minimally invasive character, it indeed was *prima vista* plausible to assume that ART could also find a place there. However, now, ART had to and will have to compete in outcome results derived from classical methods and materials of restorative dentistry and with hundreds of studies—though with different levels of quality—available concerning failure or survival rates. Furthermore, the question now is, is this still ART? Caries removal with an excavator is not new, and the author of this editorial was taught this many years ago in dental school as well as the possibility of not using engine-powered drills in certain clinical cases like anxious children. Also, glass ionomer cement (GIC) was used in such cases before ART was introduced. On the other side, widening of the opening of small cavities with hand instruments or the use of (improved) GIC in occlusal surfaces has been attributed to ART. It would be helpful, though, if a common basis of understanding what ART contributed to dentistry could be formulated. Again, the present overview article [1] could be a starting point.

The comparative evaluation between results with classical methods and materials in restorative dentistry and data derived from ART studies was and is difficult due to several

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reasons: one was that the definitions of failure and the evaluation criteria are different between the ART evaluation system and in the many outcome studies for classical dental treatment methods/materials using, e.g., modified USPHS or FDI criteria, the latter also including occlusal parameters. This is also addressed in the present article [1]. So, direct comparison becomes difficult, and now, people start to argue about the (low) quality of the articles from “the other side.” This is not very helpful and cannot compensate for good comparative studies. The studies in developed countries directly comparing ART or other minimally invasive and other potentially remineralizing techniques and the classical methods are indeed rare, especially those not done by the inventors or advocates of ART, and such studies are highly warranted.

However, this is not the end of the story. The last step is that certain people (*not* the inventors of ART) have announced that ART could totally replace classical treatment methods/materials, especially amalgam. The advocates of this idea were from the anti-amalgam movement. Now, apparently, a political dimension became apparent from a side whose primary interest was not the best dental care in general, but the removal of one material from the dental armamentarium. Recently, UNEP decided to develop a legally binding document on mercury related to the environment. While this in itself is a very complicated subject with the discharging annually of tons of mercury into the environment by small-scale gold mining and the burning of fossil fuels on the one side and large underprivileged

populations living on such activities on the other sides, the anti-amalgamists try to misuse these activities to pursue their much-focused interests, and they officially proposed ART to generally replace amalgam. However, it has been made clear even from the inventors and the advocates of ART that the idea of total replacement of amalgam by ART is not at all based on data and that is not even plausible (Frencken J, 2012, personal communication; Navarro MF, 2012, personal communication; Leal SC, 2012, personal communication).

Based on present evidence, it is generally agreed that further evidence is urgently needed to define the future role of ART in dentistry, and comparative clinical studies are warranted. However, two things seem clear so far: on the one side, ART has gained a firm place in dentistry, but on the other side, it will not and does not intend to totally replace all other caries treatment methods and materials. And, the inventors and the advocates of ART strongly oppose any misuse of their ideas and intentions in this context (Frencken J, 2012, personal communication; Navarro MF, 2012, personal communication; Leal SC, 2012, personal communication).

References

1. Frencken JE, Leal, SC, Navarro, MF (2012) Twenty-five-year atraumatic restorative treatment (ART) approach: a comprehensive overview. Clin Oral Investig. doi:[10.1007/s00784-012-0783-4](https://doi.org/10.1007/s00784-012-0783-4)

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