Minimally Invasive Dentistry

Dear Reader,

The phrase Minimally Invasive Dentistry first occurred in Pub Med 1987. It sounds benign and appears to have a significant semantic impact factor. But what does it mean?

Various vague definitions of the concept have circulated. These range from insinuations of supervised neglect to those claiming it is all about air-abrasion and fissure sealants. A few descriptors that attempt to delineate the concept might be appropriate.

Researching the literature for 'minimally invasive' reveals medical surgical procedures including laparoscopy. Obviously, the phrase means less cutting and less removal of healthy tissue. It follows that it is better to cut and remove a smaller amount, so long as everything intended to be removed is removed. It is also clear that it is not easy to cut and remove the exact amount needed.

In contrast to the medical profession, most dentists see their patients on a regular basis and have the opportunity to intercept disease at an early stage – often before the disease has produced recognizable symptoms, like cavities, periodontal tissue loss, or pain. It is clear that we cannot just transfer the 'minimally invasive' concept from medical surgery without substantial modification, including procedures dealing with early disease interception.

The motives within restorative dentistry are clearly those that favour a minimally invasive approach. Secondary caries and filling fractures are the main reasons for restoration replacements, which mean that the disease that caused the problem in the first place was not successfully addressed. Also that fillings are not physically resistant.

Minimally Invasive Dentistry, Minimal Intervention Dentistry, Preservative Dentistry, and Atraumatic Restorative Treatment sound similar, and embrace similar ideas. However, to be able to spread the message successfully it is now time to agree a common definition. My proposal is certainly not an invitation to start an academic discussion on semantics, but rather – because prevention and cutting teeth are converging in practice and in research – a call for the creation of a common platform.

Minimally invasive dentistry is a concept that can embrace all aspects of the profession, from soft tissue surgery to incipient caries lesion diagnosis and causal treatment. Within cariology, the concept has lately evolved faster since we now better understand the disease, and because the evidence-base on the short survival of restorations prompts action. We can intercept in disease development, and we have the technical possibilities to remove a minimal amount of healthy tooth substance and make smaller adhesive fillings. There has been a change from 'caries lesions are treated surgically' towards 'caries lesions are treated by addressing their causes', as well as a shift towards a more tissue-preserving approach when restoring teeth. However, more evidence needs to be generated within the concept.

Minimally invasive dentistry does not advance early irreversible treatment modalities before the arsenal of biological preventive measures dealing with the disease causes are exhausted. It is clearly the case that restorations will have a limited survival if the disease is not controlled, and where such a premature introduction of the tooth to the re-restoration cycle is not in agreement with available evidence. To place a filling in a tooth without addressing the cause is rather like 'shooting the messenger'. Placing a filling as the only procedure merely solves the problem temporarily.

For example, Minimally Invasive Dentistry in cariology includes:

1. Accurate diagnosis of risk, disease and lesions
2. Primary prevention
3. Just in time restoration
4. Minimally invasive operative procedures
5. Secondary prevention

This list expresses a concept that can easily be used within dentistry as a whole. Diagnosing lesions is becoming more important, since the recognition of an early lesion seldom leads to surgical intervention. The trend in cariology today is to delay restoration, particularly in countries where patients are recalled on a regular basis. 'Just in time' restoration means that the restoration is placed when caries is actively in progress and has just passed the borderline where it cannot be stopped by other means.

Today, the means, methods and opportunities for Minimally Invasive Dentistry seem to be at hand, but incentives are definitely lacking. Patients and third parties seem to have been convinced that the only solutions that count are replacements – i.e. it is 'OK' to pay for a filling but not for procedures that can help to avoid a filling in the first place. Patients need to be informed, and dentists reimbursed – both for healthy teeth, and for more time-consuming technical procedures.

Docent Dan Ericson
Department of Cariology
Faculty of Odontology
Malmö University

President Academy of Minimally Invasive Dentistry