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## Selecting the ideal esthetic restorative material: some clinical aspects and suggestions

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During the 11<sup>th</sup> Closed Meeting of the European Academy of Esthetic Dentistry (EAED), a new format was tried whereby five EAED Active Members presented their contribution concerning the selection of the “best” restorative material to the collective discussion.

These contributors were:

- Michele Bovera – All ceramic material selection: how to choose in everyday practice
- Daniele Rondoni – Zirconia: some practical aspects from the technologist’s point of view
- Amélie Mainjot – Recent advances in composite CAD/CAM blocks
- Sanjay Sethi – A clinical case involving severe erosion of the maxillary anterior teeth restored with direct composite resin restorations
- Bruno Fissore – A clinical case of a patient with a history of anorexia nervosa restored with all-ceramic restorations

As could be expected, a large variety of clinical aspects and parameters for the decision-making process were presented and discussed. The following statements represent a summary of the discussion and of the shared approach to this subject matter.

- Before selecting a restorative material, it is mandatory for the clinician to properly diagnose the periodontal, dietary, occlusal, and behavioral etiologic factors that have contributed to the breakdown. As a logical consequence, these factors must be brought under control by formulating an accurate prognosis, and through the application of a proper treatment plan.<sup>1</sup>

- Material selection in general is guided by scientific data, personal and general long-term clinical experience, economic parameters, guarantee issues, and ethics.<sup>2</sup>
- Material selection in prosthodontics is mostly done together with or mainly by the dental technician, especially when color-related and translucency related aspects are taken into consideration.<sup>3</sup>
- Material selection should be based on scientific evidence (systematic reviews, meta-analyses), and on manufacturer recommendations (instruction manuals) or the authorization of government agencies; however, common sense, including the clinical experience of dentists and their colleagues, should be taken into account in the decision-making process.<sup>4,5</sup>
- Regarding full-mouth reconstructions, especially on implants, the most reliable and all-round material seems still to be metal-ceramics. Case reports and a few short-term follow-up studies document the promising behavior of monolithic zirconia. Although composite resins perform better, a rather high rate of repair must be expected when using them as veneering materials.<sup>6-8</sup>
- For single restorations, a variety of all-ceramic materials (ie, glass-matrix ceramics such as lithium disilicate, and polycrystalline ceramics such as zirconia) have successfully been used (based on long-term studies), especially in the anterior zone, but also in the posterior region, replacing metal-ceramics.<sup>9-11</sup>
- The irreversible movement from manual manufacturing to robotic fabrica-

tion of monolithic and/or multilayered ceramic and/or composite blocks will lead to further standardization of the clinical and technical workflow and to the increased use of all-ceramic restorations.<sup>12,13</sup>

- Regarding zirconia, the probable advent of low temperature degradation must still be observed and awaited in the medium to long term.<sup>14</sup>
- Direct composite resins fulfill clinical demands if their indications are respected, especially factors such as the size of the restoration, its location, and the stress potential. The application of these materials must form part of a comprehensive decision-making process that includes manufacturers' instruction manuals, patients' specific risk factors (eg, bruxism), and the technique sensitivity of dentists and dental technicians.<sup>15,16</sup>
- New CAD/CAM composite materials, such as polymer-infiltrated-ceramic-network (PICN), seem to be promising from the point of view of *in vitro* mechanical and toxicity properties. They could be used as noninvasive, etchable, and adhesively bondable restorations or as crowns on implants. However, clinical data must be awaited before their general application can be promoted.<sup>17,18</sup>

In summary, the so-called “best material” for our patients is the one that is best able to: *i*) compensate for the risks of

the patient (eg, bruxism, occlusal disorders, loss of tooth structure due to dietary habits or medical conditions), *ii*) reduce the risks of the dentist (eg, demanding preparation and adhesive bonding, lack of manual skills and intellectual abilities), and *iii*) absorb the risks of the technician (eg, learning curve regarding materials and methods, technique sensitivity).

To avoid biomaterial-related complications and irreversible fractures, the recommendations of the manufacturer have to be respected. This is especially true for a biomaterial-related preparation of the tooth or abutment, the consideration of a minimal wall thickness and a minimal connector cross-section area, a cusp-supporting framework design, the adequate processing and conditioning of the tooth surface, and the suggested conventional or adhesive incorporation. During risk assessment, the choice for any new biomaterial has to be weighed against the gold standard of porcelain fused to metal restorations. Furthermore, the longevity of the rehabilitation has to be borne in mind as the paramount goal to reach through the decision-making process.<sup>19,20</sup>

We hope that you find the five papers presented here to be clarifying and informative.

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