A 70-year-old female patient presented to our practice complaining of pain in the region of the upper canine. Clinical examination revealed a carious exposure of the cervical root surface, complicated by a partial exposure of the pulpal tissue. The tooth was restored using a quartz-fibre post and a composite core material.

The patient was first referred to a specialist, who performed root canal treatment to eliminate the germs and their metabolites from the root canal. The tooth was restored using a quartz fibre post and a composite core material. The subsequent restoration had to fulfil certain requirements in terms of functional and aesthetic design, as well as gingival adaptation in order to integrate successfully into the intra-oral situation of the patient.

Preparation of the tooth is very important for achieving this outcome. It is particularly important to determine the preparation margin, which must be clearly defined with a regular contour. These basic requirements must be fulfilled to ensure optimal application of the impression materials. The type of preparation margin depends on the restorative material selected; in this case, the margin was prepared as a modified deep chamfer. Geometrically, this type of margin design is between an extended deep chamfer and a rounded shoulder.

The tooth was also prepared to depth of 1 mm, which is essential for attaining a good result.5

One of the most important requirements is the convergence angle between the two opposing axial walls. Some clinicians recommend an angle of 8°, which is sufficient to achieve in clinical practice. Others recommend an angle of between 10° and 22°.4

The interim or temporary stage is very important with aesthetic dental restorations, as it allows the material to flow uniformly onto the surface of the tooth, including sub-gingivally. A feature of Panasil initial contact light is its good flowability, even when residual moisture is present.

The clinical success of a fixed restoration depends on a precise impression of all the details of the prepared tooth (Fig. 5). In summary, it can be stated that an accurate fit of crowns and fixed partial dentures depends on the impression. Inaccuracies during impression-taking can only be corrected with difficulty or not at all during the subsequent fabrication stages, which has an effect on the marginal adaptation of the restoration we fabricated.13

The one-step putty-wash technique was used in this case...
for fabricating the restoration. It has been proven in invitro studies that impressions fabricated using this technique exhibit a higher detail definition than two-step putty-wash impressions. As the initial contact of the impression material with the oral mucosa is the critical moment clinically, we focused on a material that becomes hydrophilic with increased relative humidity and maintains its hydrophilicity throughout the entire working time. We therefore selected the impression materials Panasil tray soft and Panasil initial contact light (Kettenbach). Panasil initial contact light was applied to the suprasying using a brush (Fig. 6), prior to being loaded with Panasil tray soft (Fig. 7). The flowability of the light material, viscosity of the tray soft and the pressure produced by the dispensor ensure that the impression material flows uniformly onto the tooth surface, including infra- and supragingivally.

Another characteristic of this material is that it is easily removed from the mouth, which may be a problem when using polyether materials. The thixotropic properties (positional stability) of Panasil initial contact light prevent the impression material flowing into the oral cavity when the impression tray is inserted into the oral cavity. The intra-oral working time of 1 minute and intra-oral setting time of 2 minutes and 50 seconds are very practice friendly. The combination of Panasil tray soft and Panasil initial contact light is impressive: the products ensure perfect reproduction of all the details of the tooth in the impression (Figs. 8, 9 & 10).

Technical procedure

The most commonly used material for fabricating models is Class IV dental stones, owing to their compatibility with all types of impression materials. As luting material is distributed onto the tooth surface, including infra- and supragingivally, it has been shown that the tissue can be adequately protected. In this case, we were required to select the luting cement, which was autoclaved. The luting cement influences the accuracy of the restoration, because any inaccuracies in the restoration can lead to a loss of function and esthetics. It has been shown that the cement gap required was determined using CAD.

Clinical finishing

Cementation is the final stage of prosthetic treatment. It should be noted that while the luting cement does not provide the dentist with the possibility of correcting inaccuracies in the restoration, it does contribute to clinical success. The luting cement influences the functional performance of a prosthodontic restoration; should the wrong cement be selected or used incorrectly, it can have an adverse effect on the service life of the crown. A high compressive strength is one of the most important properties.

As luting material is distributed in very thin layers, it must be capable of withstanding compressive loading in order to prevent fractures. We used glass ionomer cement that has not only a high compressive strength, but also the advantage of fluoride release. A comparative study of various cements established that the glass ionomer cement we used in this case produced the least film thickness of 20 μm. A follow-up examination was completed one week after permanent cementation to check the integration of the prosthodontic restoration into the tissue. The clinical procedure was completed with a further follow-up examination to check the cuspal relationship, which in most cases cannot be completed satisfactorily when fitting the restoration, owing to stress to the patient. The correct use of a temporary restoration and an adequate morphological design of the permanent restoration contributed to good adaptation of the incisor tooth papilla, as was established at intervals of 30, 60 and 90 days (Fig. 17).