Orthodontic treatment with the clear plastic aligner is becoming one of the most popular treatment options among adults and teenagers. The high precision of the virtual planning of the case leads to well fitted thermoformed plastic aligners and an individualized treatment for each patient. Several cases were treated with Clear Aligner therapy. All treatment outcomes were previsualized with the digital OrthoAnalyzer CAD software (3Shape) in order to design specific appliances for specific dental movements, with a lower risk of root resorption or other secondary effects. All desired dental movements can be measured and then transposed into a series of amorphous plastic aligners. Patient compliance and communication with the dental laboratory are enhanced due to the continuous developing of the CAD/CAM technology and Clear Aligner system.

Keywords: digital setup, OrthoAnalyzer, plastic aligners
Our study objective was to emphasize the importance of the communication between the orthodontist and the dental laboratory\cite{10}. By using the R700 3 Shape digital scanner in order to create a virtual model of the patient’s dental situation and the OrthoAnalyzer CAD software to plan the treatment mechanics, this communication is improved. The software allows an accurate treatment planning, previsualization of the final result and computer assisted manufacturing of the needed number of aligners.

A high precision appliance can be achieved, leading to a successful treatment outcome. The digital software provides a tool box with multiple features such as arch symmetry, amount of interproximal reduction, auxiliary attachments for better control of specific dental movements, use of elastics, etc. The needed number of aligners and the treatment time can also be easily estimated.

**Experimental part**

In order to evaluate the effectiveness of the digital setup regarding treatment planning, we decided to use the Clear Aligner technology in some clinical cases. The experimental digital setup was performed in S-Rotarius-Kieferorthopädisches-Labor, Switzerland. The patients were satisfied with this alternative because of its esthetic advantage compared with the traditional straight-wire bracket appliance. A clinical case was selected in order to emphasize all the information stated above (fig. 1).

This patient was unsatisfied with her smile because of her crowded teeth. All treatment options were presented and Clear Aligner therapy was chosen \cite{13}. Impressions were taken, scanned, and the digital setup was created. This allowed us to design the resin attachments, the series of plastic aligners and previsualize the expected orthodontic results. This also helped us with patient compliance \cite{10} due to the previsualization option with the OrthoAnalyzer CAD software (fig. 2-5).

Vertical resin attachments (fig. 6) were added on all canines and molars and on the lateral incisor in order to have better control regarding rotations, tipping and cross bite correction \cite{11}.

**Results and discussions**

OrthoAnalyzer provides measurements of the expected dental movements in order to provide an accurate thermoplastic appliance. Every aligner must induce enough tension on the dental surface without leading to the aligner’s wear off \cite{12, 14}. Without any specific requirements the orthodontic treatment would simply be randomly conducted. For our case report several measurements were conducted (table 1).

<table>
<thead>
<tr>
<th>Tooth</th>
<th>Rotation</th>
<th>Angulation</th>
<th>Inclination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>-2.8</td>
<td>-0.8</td>
<td>0</td>
</tr>
<tr>
<td>1.4</td>
<td></td>
<td>-0.8</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>-7.8</td>
<td></td>
<td></td>
</tr>
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<td>1.2</td>
<td>25.8</td>
<td>2.8</td>
<td>5.3</td>
</tr>
<tr>
<td>1.1</td>
<td>0</td>
<td>0.5</td>
<td>2.9</td>
</tr>
<tr>
<td>2.1</td>
<td>-4.6</td>
<td>-0.1</td>
<td>1.4</td>
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<tr>
<td>2.3</td>
<td>35.4</td>
<td>4.7</td>
<td>6.4</td>
</tr>
</tbody>
</table>

Because of these specific values, (measured in degrees) accurate appliances from plastic material were designed for this selected case. The treatment outcome is more precise (fig.7,8) with the use of the digital setup compared with the classic one (that some dental laboratories still use) due to human error elimination.
Conclusions

Modern appliances and virtual planning of the treatment allows orthodontists and patients to visualize the final orthodontic goal. This is very helpful when it comes to patient compliance and full time wear. The case report presented above emphasizes the accuracy and efficiency of the digitalized treatment mechanics. Starting with an optic impressions, a digital 3D scanner (R700 3Shape), a digital printer for the dental arches and a computer aided design of the amorphous plastic aligners (OrthoAnalyzer 3Shape) provides an individualized orthodontic treatment for each case.

Special pliers are also provided from Clear Aligner to customize and activate the appliances. Diagnosis and case selection becomes much easier, reducing significant chair time. These appliances provide a better alternative to braces due to its multiple advantages: esthetics, comfort, less risk of pronunciation problems, root resorption, caries, decalcifications and gingivitis. More studies are required to extend the use of the Clear Aligner system when it comes to more severe malocclusions.

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