KIEFERORTHOPÄDIE PADERBORN

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INDIRECT BONDING WITH ANALOGUE TRANSFER SPLINTS, FOLLOW UP OVER 20 YEARS

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Aim:

Further development of a method: optimization and adaptation of analog indirect bonding as an integral part of multi-bracket-therapy. Inventory taking into account the current workflow.

Material & Methods:

The first implementation of the indirect bonding process belonging to this contribution is about 25 years ago. In terms of a continuous improvement process as a part of quality management, the process was systematically evaluated, regarding clinical and radiological findings, laboratory process and the workflow during the entire period. Alternative partial steps and materials were evaluated in a comparative way, using the actively self-ligating Adenta Flair® brackets.

Laboratory procedure

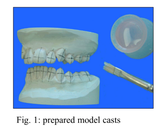
Fig. 1: prepared model casts

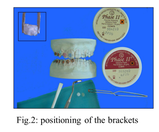
Fig.2: positioning of the brackets

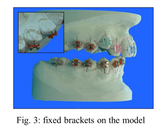
Fig. 3: fixed brackets on the model

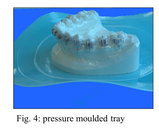
Fig. 4: pressure moulded tray

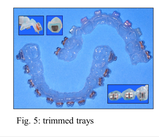
Fig. 5: trimmed trays

1. Proper taken impressions and good plaster casts are basics for correct tranferance. The bracket position is marked before isolating to avoid graphite contamination of the adhesive. (Fig. 1)
2. The plaster cast is isolated twice. Adhering plaster particles on the individualized bracket bases would disturb a thin bracket-tooth interface and reduce bonding strength. (Fig. 1)
3. By covering brackets with elastic ligatures no extratime for blocking out undercuts is necessary. Easy intraoral removal of the tray is possible. (Fig. 2)
4. To fix the brackets in the correct position the bracket meshes are coated with a thin layer of the mixed two paste adhesive (Phase II ® [2]). The adhesive excess is taken off accurately. (Fig. 2 / 3)
5. Pressure moulding of a 0,5 mm layer of Copyplast® (Fig. 4).
6. The tray is trimmed with scissors on the oral side up to the equator, on the vestibular side up to the lower bracket wings.To prevent capillar creeping of sulcus-liquid the tray must not get into contact with the marginal gingiva. (Fig. 5, 8)

Clinical procedure


Fig. 6: preparation of the teeth

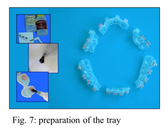
Fig. 7: preparation of the tray

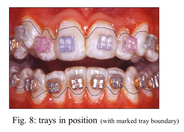
Fig. 8: trays in position (with marked tray boundary)


Fig. 9: situation after removal of the trays (detail: bracket environment without any bonding surplus)

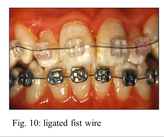
Fig. 10: ligated fist wire

1. The use of a dryfield system with bite-raiser isolates well and enables an easy occlusal positioning of the tray. The teeth surfaces are prepared and conditioned as usual. (Fig. 6)
2. The bracket bases are cleaned with acetone. To ensure maximum adaptation the tray is cut twice. The segmentation reduces tension and allows better control of the tray seating.
3. Maximum Cure ® [2] is mixed in a 1:1 ratio. The individualized bracket bases and the enamel are coated with the bonding agent. (Fig. 7)
4. The tray is positioned over the teeth and held firmly in place with light and equal pressure. Transparency allows a control of proper seating anytime.
5. Step 3 and 4 are repeated till all tray segments are bonded. (Fig. 8) The used bonding agent provides rapid curing. While positioning the first tray segment, the next one can be prepared.
6. The Copyplast is taken off with a small mosquite-forceps form oral to buccal. No further intraoral cutting of the tray is necessary. Finally the initial wire is ligated. (Fig. 9 / 10)

D.Paddenberg, P. Niemann; Indirect Bonding—synthesis between precision and economy, AAO 104th Annual Session, Orlando, USA, May 2004

Results

Although the original indirect bonding method had already proven itself in daily practice, a critical evaluation showed, that there was still development potential. In a laboratory process the brackets are temporarily bonded to the plaster model using Phase Two®. They thus receive an individualized base with no excess adhesive. The former one-piece, vacuum formed, soft transfer splint could not be ideally adapted to all teeth. A tripartition in turn led to axis errors, especially on the lateral incisors. The correction with overlapping segments increased the lab effort. Now, a one-phase vacuum formed Bio Plast® transfer splint is currently being reinforced with a silicone wall. This allows the brackets to be safely applied in just one step with little effort in the laboratory and chairside. The materials used, Phase Two® and Maximum Cure® ensure an effective bonding process without excess adhesive on the bracket edges. Especially measuring the model and always having an orthoradial view/access to all teeth allows high precision in bracket positioning, even with a reduced mouth opening.

Conclusion

A continuous improvement process of orthodontic methods optimizes practice workflows and contributes to quality assurance. In the case of indirect bonding, still outsourcing steps to the dental laboratory lead to reduced chairside and treatment times for the patient. This means an increase in comfort and a continuous high level of acceptance by all practitioners and patients. Nowadays there is more precision and efficiency in the workflow.

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