



TECHNICAL NOTE

A new type of occlusal wafer for orthognathic surgery

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INTRODUCTION

Occlusal wafers are commonly used to establish the intermediate and final position of the occlusion during orthognathic operations. Various problems have been experienced in the construction of these wafers. Acrylic wafers have poor compressive and tensile characteristics, take time to make, and are bulky. They can also distort while curing, increasing the risk of inaccurate localization of the jaws during operation.

To improve the speed of acrylic wafer preparation, self-cured acrylic resin is often used, but monomer leach may irritate soft tissues. In addition, strength has been improved by using carbon fibres.¹ Alternatively a clear silicone wafer has been recommended which reduces the time taken to make the wafers and the overall cost. Nevertheless, this material may be too flexible to permit accurate positioning of the jaws.²

Problems may be encountered in stabilizing an acrylic wafer during orthognathic operations while the maxilla and mandible are being repositioned. Previously scalloped labio-buccal extensions to the wafer, which are perforated, have been used to wire the wafer to the orthodontic brackets. However, the wafer is cumbersome and both the construction in the laboratory and the placement in theatre are time-consuming.

To overcome these problems of labour intensity, dimensional stability and occlusal accuracy, a new technique for making wafers has been developed using light-cured acrylic resin (Traid Trans Sheet, Trubyte Dentsply). To stabilize the wafer during operation, orthodontic elastic power chain is incorporated into the wafer.

TECHNIQUE

After model surgery has been done and the desired occlusion achieved on the articulator, Traid model release agent is applied to both casts. Traid Trans Sheet is then adapted to the occlusal surface to a sufficient thickness to allow indentations to be created by the opposing teeth when the articulator is closed. One end of

a 2-cm length of power chain (elastomeric orthodontic elastic chain) is placed into the resin in the premolar region on each side (Fig. 1). This is cured for 4 minutes in visible light with the Triad light-curing unit. The wafer is then removed. Triad air barrier coating is applied along with the incorporation of the patient's name and the wafer is cured for another 4 minutes. The wafer is then finished and polished before use.

Advantages

This wafer takes just 15 minutes to make. It is thin and rigid and gives an accurate fit. It is dimensionally stable;



Fig. 1 Occlusal view of wafer showing power chain incorporation.



Fig. 2 Wafer held in position on maxillary dentition.

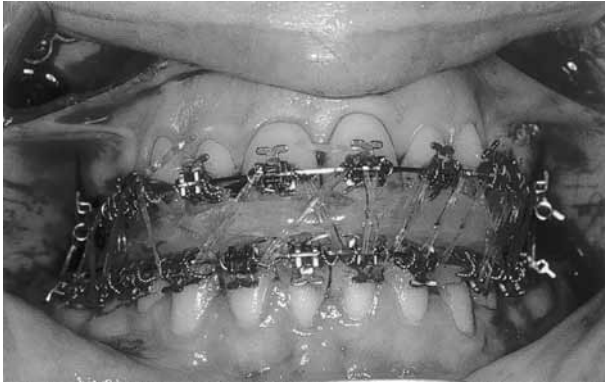


Fig. 3 Stabilization of maxilla and mandible with power chain.

the material is inert and does not leach monomer. The incorporated power chain makes it easy to locate and secure to the maxillary teeth (Fig. 2). When used in conjunction with power chain for inter-maxillary fixation,³ it completely abolishes the use of wires (Fig. 3), preventing glove perforation at operation. Also, the patient's name is incorporated in the wafer with an arrow indicating which way up the wafer should be placed.

Disadvantages

The wafer can be brittle and may break if dropped on to a hard surface.

REFERENCES

1. Telfer MR, Page KB. Carbon fibre reinforced osteotomy wafers. *Br J Oral Maxillofac Surg* 1990; 28: 210–211.
2. Sunderland T, Bainton R. A new technique for the construction of interocclusal wafers in orthognathic surgery. *Br J Oral Maxillofac Surg* 1995; 33: 321–322.
3. Smith A. The use of orthodontic chain elastic for temporary intermaxillary fixation. *Br J Oral Maxillofac Surg* 1993; 31: 250–251.

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