

**CLINICAL
SECTION**

An accurate system of serially recording anterior open bite using a modified technique for impression taking and study model construction

C. S. Kyi and M. Mars

Great Ormond Street Hospital for Children NHS Trust, London, UK

A simple impression technique is described that enables the clinician to record an anterior open bite, to provide accurate study model construction, and to monitor the anterior open bite. A case is presented that illustrates this technique with subsequent monitoring over an 8-year period

Key words: Anterior open bite, impression technique, study model

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Introduction

A problem of obtaining study models in the correct occlusion is compounded when patients present with an anterior open bite. Not infrequently, the models are returned from the laboratory with the teeth in occlusion. This is because of poor bite registration and the disbelief on the part of the technician that the patient really does present with a gross open bite.

A modified system of impression taking which accurately records the extent of the anterior open bite is presented. This system was originally designed by J. D. Muir (personal communication).

He designed a system rather like an oral screen with a handle on which alginate impression material was forced around the dentition in occlusion. The resulting impression was cast as a single piece of plaster, thereby recording the correct anterior open bite relationship (Figure 1).

A modification of this approach uses a boomerang-shaped sausage of silicone impression material, which is placed between the upper and lower dental arches. The patient is asked to occlude fully into the material whilst the orthodontist moulds the material around the labial and buccal surfaces. The patient meanwhile presses the material against the lingual surfaces with the tongue (Figure 2). The impression is cast as one block.

Case report

The following case report illustrates the use of this technique. First, it demonstrates the accuracy of recording the initial anterior open bite and, secondly, it confirms that we can follow the natural change over the next 8 years.

A 10-year-old Caucasian female was referred to Great Ormond Street Hospital (GOSH) from Cornwall at the age of 3½ months, with a diagnosis of an enlarging cystic hygroma that involved the neck, face and floor of the mouth (Figure 3).

In view of the increasing size of the lesion a partial surgical resection was undertaken at this stage. A further surgical excision of the residual lesion was carried out at the age of 6 years. The patient has had no further surgery and is under regular review with the Surgical Team.

At 3 years of age an anterior open bite was evident, and the patient was referred to the Maxillofacial and Dental department at GOSH.

The cystic hygroma was obviously an etiological factor in creating the open bite. The size of the lesion and involvement of the floor of the mouth produced unfavorable forces on the soft tissues and skeletal pattern.

The patient has been followed up at yearly intervals in the department and the anterior open bite recorded at each review.



Figure 1 Oral screen with handle



Figure 2 Impression *in situ*

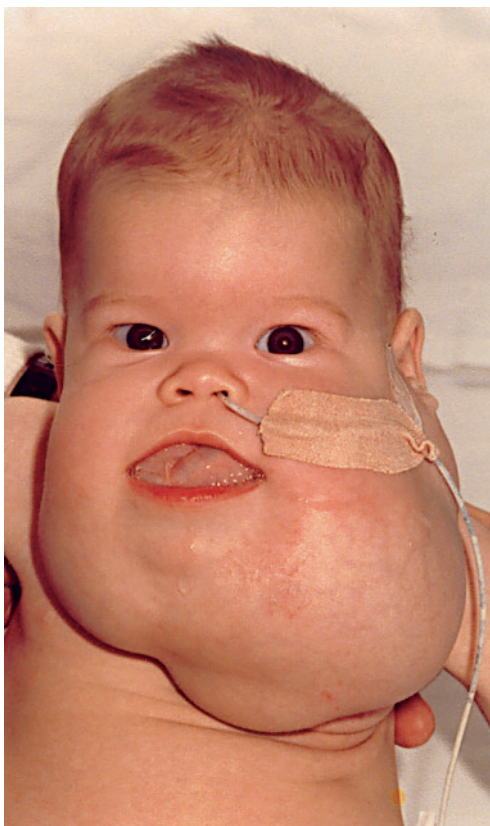


Figure 3 Enlarged cystic hygroma (13 March 1991)

This has been carried out using the modified impression technique to produce accurate study models. As stated previously, the impression technique uses silicone impression material and no impression trays.

Silicone impression materials are widely used particularly in fixed prosthodontics as it provides accurate reproduction of the oral tissues and has excellent dimensional stability.¹ The impression material most commonly used by orthodontists is alginate, an irreversible hydrocolloid impression. For the purposes of orthodontic impressions, it has been shown that there is no advantage of using silicone impression materials, as alginate material cast immediately proves satisfactory in clinical usage.² Nevertheless, for the purposes of recording the anterior open bite silicone impression material has more advantageous dental material properties allowing the impression to be taken without the need for an impression tray.

A medium body addition silicone impression material is used to record the occlusion and anterior open bite (Figure 4).

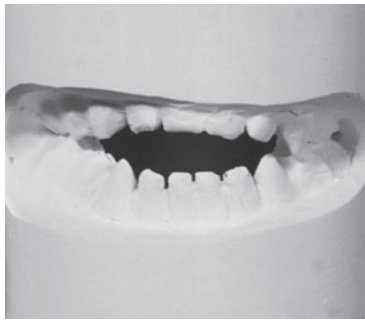
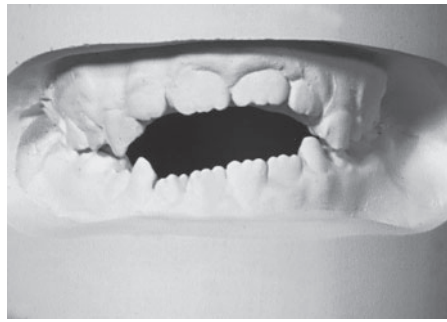
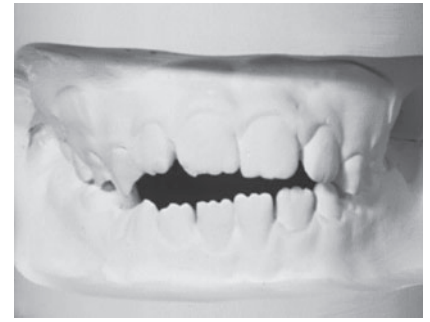
A modification of the technique is to have a second stage using a light body wash silicone impression material, which is applied onto the initial impression and then placed back in the patient's mouth ensuring it is seated correctly (Figure 5).



Figure 4 Impression using medium body silicone



Figure 5 Impression with a light body wash

Figures 6–10 Serial study models**Figure 6** 4th March 1993**Figure 7** 22nd April 1998**Figure 8** 8th March 2000**Figure 9** 11th April 2001**Figure 10** 9th April 2002**Figures 11 and 12** Progress of anterior open bite**Figure 11** 3rd March 1994**Figure 12** 9th March 2002**Figure 13** Patient 9th April 2002

The light body wash will show finer detail, but there is the risk of wash thickness influencing the accuracy of the recording by increasing the occlusal vertical dimension and, thus, artificially increasing the actual anterior open bite.³ There is also the further risk of introducing further errors by not re-seating the initial impression correctly and the whole process having to be repeated. The errors can be minimized by trying a 1-stage technique with both medium body and wash together, but a 2-step putty-wash technique with control of the wash bulk remains the most accurate method for cast restorations.⁴ The models are

cast up with the impression still present in between the upper and lower models.

The study models produced show the anterior open bite in full view. Serial study model records of the anterior open bite have been obtained with this patient using the modified impression technique (Figures 6–10).

This technique has allowed an accurate monitoring of the progress of the patient's anterior open bite. In this case, the open bite has reduced (Figures 11 and 12) and the patient has no complaints. At the present time, no active treatment is required, but the patient will continue to be monitored at yearly intervals (Figure 13).

References

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